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Identification of Predictors of Repeat Parasuicide

by

Ian Richard Colman

A thesis submitted to the Faculty of Graduate Studies and Research in partial fulfillment of the requirements for the degree of Master of Science

in

Medical Sciences – Public Health Sciences

Edmonton, Alberta

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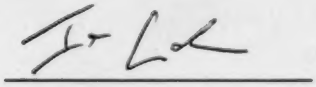

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The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research for acceptance, a thesis entitled *Identification of Predictors of Repeat Parasuicide* submitted by Ian Colman in partial fulfillment of the requirements for the degree of Master of Science in Medical Sciences – Public Health Sciences.

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Abstract

Parasuicide is a major cause of suffering and places a heavy burden on the healthcare system. A cohort study was conducted in which 455 cases of parasuicide were recruited from Edmonton emergency rooms. Initial interviews took place within two weeks of presentation; data was collected on precipitating factors for the index parasuicide, psychiatric and medical history, stressful life events, previous parasuicides, hopelessness, anger, self-esteem, and social adjustment. A follow-up interview of 372 individuals took place one year later to determine whether a repeat parasuicide had occurred since the initial interview. A logistic regression analysis was performed with repeat parasuicide as the dependent variable. The final model identified four significant predictors: previous parasuicide, a history of depression, a history of schizophrenia and poor physical health. In addition, the study provides evidence that the risk of repeat parasuicide for an individual is greatly increased when three or four of these predictors are present.

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Chapter 1 - Introduction

1.1 Mental Health

"Major depression is the most common clinical problem primary care physicians are called upon to diagnose and treat (Katon & Sullivan, 1990, p.3)." The prevalence of mental health disorders reached pandemic proportions around the world long ago. In 1996, the World Health Organization (WHO) estimated that as many as 1.5 billion people worldwide at any given time are suffering from a neuropsychiatric disorder (WHO, 1996). This figure represented more than one quarter of the world's population at the time. These disorders range from mood and anxiety disorders to substance abuse disorders to neurologically debilitating diseases. However, regardless of the type of illness, mental health problems have many common results: they cause disablement, suffering, and stigmatization for both the victims and their loved ones (WHO, 1996).

While the cost of suffering and stigmatization is difficult to measure, the disabling effects of mental health disorders can be quantified. The results are astonishing. The WHO estimates that neuropsychiatric disorders accounted for almost 12% of deaths and lost productivity due to disease and injury worldwide in 1998 (WHO, 1999). In the same year, major depression was calculated to be the fifth leading cause of the global burden of disease, ahead of many more commonly recognized causes of disease and disablement such as heart disease, malaria, and road traffic accidents (WHO,

1998b). Unfortunately, Canada is no exception in this regard. Statistics Canada estimated that there were 767,000 Canadians between the ages of 18 and 44 suffering from depression in 1995(b), comprising 6.3% of Canadians in that age group.

However, despite these overwhelming statistics, only recently has mental health begun to receive the attention it deserves as a public health priority. On November 12, 1999, the director-general of the WHO announced new global strategies to improve mental health worldwide. Dr. Gro Harlem Brundtland admitted that the burden of neuropsychiatric conditions has been underestimated for many years.

Of all the effects of mental health disorders, none is more devastating than suicide; not only does suicide take lives, it also causes immeasurable grief and guilt for surviving loved ones. There exists an undeniable link between mental health disorders and suicide. It has been shown that 90% of people who commit suicide were suffering from a major psychiatric illness at the time (Black & Winokur, 1990). Suicides among those who are not mentally ill are relatively rare.

1.2 Suicide

Given the prevalence of mental health disorders, and the link between these disorders and suicide, it is not surprising that suicide ranked as the twelfth leading cause of death worldwide in 1998 (WHO, 1998a). There were 948,000 suicides in the world that year; approximately one every 33 seconds (WHO, 1998a). To make matters

worse, it is still generally accepted that suicide rates are often under-estimated. Two 1995 studies in the United Kingdom reported that approximately 40% of suicide deaths received an official 'cause of death' other than suicide (Cooper & Milroy, 1995; O'Donnell & Farmer, 1995). In countries, such as China, where suicide is even more culturally unacceptable, this percentage of falsely reported suicides is likely higher.

Closer to home, Statistics Canada reported 3,941 suicides in 1995(a), making suicide the tenth leading cause of death in Canada. The relative importance of suicide as a cause of death can be seen by investigating deaths in Alberta from 1995-1997. Over this three year period, there were 1307 suicides versus 1069 motor vehicle deaths (Alberta Municipal Affairs). Of particular concern is the fact that the majority of suicides occur among the young. In 1996, more than half of the suicides in Canada occurred in those under the age of 40 (Statistics Canada, 1995a). Therefore, while suicide is significant as a cause of death, its significance is even more profound as a cause of potential years of life lost; suicide was ranked as the fourth leading cause of potential years of life lost in 1991 (Health Canada, 1994). Even more troubling is the fact that the suicide rate in Canada has been steadily increasing. Although the trend has leveled off since 1985, the long term trend from 1960 to 1996 showed an almost doubling of the Canadian suicide rate (Lester and Leenaars, 1998; Statistics Canada, 1997).

Relatively speaking, suicide appears to be a particular problem at the local level. From an international point of view, the Canadian suicide rate increased sharply from

1960 to 1990, while the suicide rate in the United States remained relatively stable (Lester & Leenaars, 1998). From a national point of view, suicide appears to be particularly problematic in Alberta. In the period from 1954 to 1992 there were only two years where the suicide rate in Alberta was lower than the national suicide rate (Health Canada, 1994). And in Alberta's two major cities, the suicide rate in Edmonton was higher than the suicide rate in Calgary every year from 1984 to 1996 (Suicide Information and Education Centre, 1997). So while suicide is clearly a major international health problem, it is a notably significant problem in the City of Edmonton.

1.3 Parasuicide

Suicide, however, is a difficult research topic. Despite its importance as a cause of death, suicide is still a rare event. Extremely large cohorts of study participants need to be followed prospectively for even a few suicidal events to take place. For example, although there were 3,941 suicides in Canada in 1996, you would need to follow 7,692 Canadians to expect only one to commit suicide. More problematic from a research point of view is the difficulty of studying causes and precipitating factors of a suicide after the event has taken place, given that many of these factors are psychological and psychiatric in nature and that this information cannot be obtained. As a result, it is often more efficient to study suicidal behaviour in general.

Suicidal behaviour includes suicide and parasuicide. In lay terms, parasuicide is often thought of as 'attempted suicide'; however, there are many behaviours that are suicidal in nature but are not actual attempts to take one's life. Therefore, the term parasuicide is used to describe behaviours that are deliberate attempts at self-harm. A parasuicide may or may not be a true suicide attempt. For example, an individual may deliberately take a harmful overdose of medication with the knowledge that the dosage is insufficient to cause death. Similarly, another individual may deliberately jump from the fifteenth floor of a building with the intention to die. Both of these behaviours would be considered parasuicides, but only one is a suicide attempt.

Not surprisingly, there are overlaps and similarities between those who commit suicide and those who commit parasuicide. In some respects, however, they can be distinct groups. There are those who engage in parasuicidal behaviour but never commit suicide, and there are those who commit suicide without a prior suicide attempt. But there is also a large group who make suicide attempts and go on to complete suicides later in life. Close to half of completed suicides are preceded by a suicide attempt (Barraclough et al., 1974). Similarly, among those who engage in parasuicidal behaviour, 11% to 13% will die of suicide within five years (Johnsson, Ojehagen, & Traskman-Bendz, 1996; Nielsen, Wang, & Bille-Brahe, 1990; Rygnestad, 1988). It is clear that parasuicide is a significant risk factor for suicide. In fact, those who commit parasuicide are 42 times more likely to die of suicide than the general population (Harris & Barraclough, 1998). Therefore, the study of parasuicide can elucidate information on completed suicide.

Parasuicide is also a much more common occurrence than suicide. It is generally accepted that parasuicide is at least 8 to 10 times as common as suicide (Maris, 1992), but data in the City of Edmonton recently suggests that parasuicide may be at least 20 times as common (Bland et al., 1998). Despite these results, the true rate of parasuicide is very difficult to obtain. Diekstra (1989) points out that no country in the world keeps national statistics on attempted suicides. One of the difficulties is that the easiest method to gain parasuicide data is to collect hospital admission data. However, those who engage in deliberate self-harming behaviour may not harm themselves in such a manner that they require medical attention. A 1982 Diekstra study estimated that the percentage of parasuicides who never seek medical attention at a hospital may be as high as 75%. This indicates that actual rates of parasuicide may be four times higher than the reported rates. It is not surprising then that a 1985 study estimated that there may be 100 parasuicides for every suicide (Ramsay & Bagley).

Given the magnitude of the problem, the study of parasuicide, ignoring its relationship to suicide, is also necessary and beneficial. A parasuicide is still a significant health concern for the individual, and the cumulative number of parasuicides clearly create a large disease burden for the health care system. Although official parasuicide rates do not exist, information on the disease burden that parasuicide creates can be interpreted from hospitalization data. In Alberta in 1994, there were 2835 hospitalizations due to self-inflicted injuries, comprising 9% of all injury hospitalizations (Alberta Injury

Prevention Centre). These numbers do not include those who were treated in an emergency and psychiatric department and discharged without becoming an in-patient. It is clear that parasuicide creates a large strain on the health care system. Unfortunately, this burden is increasing; parasuicide rates have followed the same rate of increase that suicide rates have (Diekstra, 1989). There is a pressing need to address the problem of parasuicide.

Much like suicide, parasuicide appears to be particularly problematic at the local level. In 1998, Bland et al. published data on incidence of parasuicide in Edmonton. The investigators used similar methods to the World Health Organization (WHO) Multicentre Study on Parasuicide conducted in twelve cities across Europe (Kerkhof et al., 1989). The Edmonton investigators calculated an incidence rate of 466 parasuicides per 100,000 persons, per year. This rate was higher than all twelve cities involved in the WHO parasuicide study. Parasuicide, therefore, should be a significant priority for the City of Edmonton.

1.4 Repeat Parasuicide

Not only are those who engage in parasuicidal behaviour a high risk group to commit suicide, they are also a very high risk group to repeat their parasuicide. The repeat rate in the six months following an index parasuicide ranges from 11% to 37% (Batt et al., 1998; Corcoran et al., 1997; Leon et al., 1990; Petrie & Brook, 1992; Petrie, Chamberlain, & Clarke, 1988). Within twelve months repeat rates range from 12% to

38% (Buglass & Horton, 1974b; Garzotto et al., 1976; Gilbody, House, & Owens, 1997; Hjelmeland, 1996b; Hjelmeland et al., 1998; Kessel & McCulloch, 1966; Leon et al., 1990; Morgan et al., 1976; Siani et al., 1979; Suleiman, Moussa, & El-Islam, 1989). Two year repeat rates have been reported at 18% and 35% (Adam et al., 1983; Bancroft & Marsack, 1977), and five year repeat rates have been reported at 27% and 40% (Johnsson, Ojehagen, & Traskman-Bendz, 1996; Nielsen, Wang, & Bille-Brahe, 1990). Given that the rates do not significantly increase from six months to five years, it is clear that the time frame immediately following an index parasuicide is the time of highest risk. This has been confirmed by studies of timing of repeat acts, which show that the first three months following a parasuicide is the time in which the vast majority of repeat parasuicides occur (Bancroft & Marsack, 1977; Kessel & McCulloch, 1966; Leon et al., 1990).

It is estimated that half of those who seek medical attention for deliberate self-harm are not harming themselves for the first time (De Leo, 1999; Hjelmeland, 1998). These repeaters must receive particular attention in order to reduce the prevalence of parasuicidal behaviour. In addition, they are a useful research group since they have sought medical attention for parasuicide in the past, they are therefore easily identifiable, and also since they are a high risk group for repeating the behaviour.

The present study, therefore, focuses on those who repeat parasuicide. The objective of the study is to identify which factors differentiate those who repeat a parasuicide from those who do not. If successful, the study will provide emergency room

personnel with tools for identifying those who are most likely to repeat their parasuicidal act, and therefore correctly identify those who are in most need of appropriate treatment.

Chapter 2 - Repeat parasuicide literature review

This chapter presents a review of published literature that focuses exclusively on acts of repeat parasuicide. An overview of the many different variables that have been studied in relation to repeat parasuicide will be presented, key studies will be identified, the effectiveness of published predictive scales for repeat parasuicide will be discussed, problems in this research area will be outlined, and the chapter will be summarized by a discussion of the overall quality of published literature on repeat parasuicide.

The search for articles was done primarily using the Medline database and the Embase database (1966 - present). Key word terms used for the search included "parasuicide", "attempted suicide", "repeat", "repetition", and "recurrence". In addition, as articles were collected, reference lists from these articles were consulted to identify additional articles missed in the database searches.

2.1 Variables Associated with Repeat Parasuicide

2.1.1 Sociodemographic Variables

While most parasuicide investigators have considered gender and age as possible predictors of repeat parasuicides, no consistent pattern has emerged. The vast majority of the studies in this review (16 of 19) that considered gender did not find it to be a significant variable. As for age, four studies found that younger persons are

more likely to repeat parasuicide (Bagley, 1970; Buglass & Horton, 1974a; Goldston et al., 1996; Krarup et al., 1991), two studies found that older persons are more likely to repeat parasuicide (Sakinofsky & Roberts, 1990; Wilkinson & Smeeton, 1987), and six studies found age to be non-significant (Batt et al., 1998; Kessel & McCulloch, 1966; Leon et al., 1990; Ojehagen, Regnell, & Traskman-Bendz, 1991; Suleiman, Moussa, & El-Islam, 1989; Tuckman, Youngman, & Kreizman, 1968). There does not appear to be a significant association between age or gender and repeat parasuicide.

Employment and social class have been studied frequently. Unemployment has been consistently linked with repeat parasuicides in both prospective studies (Buglass & Horton, 1974a; Kreitman & Casey, 1988; Morton, 1993; Owens et al., 1994; Siani et al., 1979) and retrospective studies (Buglass & Horton, 1974b; Hjelmeland, 1996b; Kotila & Lonnqvist, 1987; Ojehagen, Regnell, & Traskman-Bendz, 1991; van Egmond & Diekstra, 1990). Morton (1993) pointed out that long term unemployment increases the risk of repeat parasuicide above short term unemployment. Many early parasuicide studies used social class as a predictive variable and found a significant association. While Bagley and Greer (1971) found a higher social class to be predictive of repeats, most studies have found those in the lower social classes to be at a higher risk (Buglass & Horton, 1974a; Buglass & Horton, 1974b; Kreitman & Casey, 1988; Morgan et al., 1976). Interestingly, Morton (1993) studied the interaction between unemployment and social class and found that those from the higher social classes who were unemployed were more likely to repeat parasuicide

than those unemployed in the lower classes.

Marital status has also been studied in association with repeat parasuicides. In this review, five studies showed an association between being separated/divorced/widowed and repeat parasuicides (Bagley & Greer, 1971; Buglass & Horton, 1974a; Hjelmeland, 1996b; Kreitman & Casey, 1988; Worden & Sterling-Smith, 1973;); however, four other studies found this to be a non-significant association (Batt et al., 1998; Hassanyeh & Fairbairn, 1985; Owens et al., 1994; Suleiman, Moussa, & El-Islam, 1989).

Similarly, an inconsistent picture emerges when considering living arrangements as a predictor of repeat parasuicide. Living alone has been shown to be significantly predictive of repeats in three studies (Buglass & Horton, 1974a; Kreitman & Casey, 1988; Wang, 1985), but non-significant in four studies (Batt et al., 1998; Hjelmeland, 1996b; Owens et al., 1994; Tuckman, Youngman, & Kreizman, 1968). A recent or frequent change of address has shown a significant association with repeat parasuicide in three studies (Hjelmeland, 1996b; Siani et al., 1979; van Egmond & Diekstra, 1990) but non-significant in three studies (Barnes, 1986; Buglass & Horton, 1974a; Buglass & Horton, 1974b).

2.1.2 Life Event Variables

Several life events have been investigated with regards to their association with repeated acts of parasuicide. Most notably, being a victim of sexual abuse is

consistently a very strong predictor of repeated parasuicidal behavior (Boudewyn & Liem, 1995; Hjelmeland, 1996b; Taylor, Kent, & Huws, 1994; van Egmond et al., 1993). Boudewyn and Liem (1995) noted that increased severity, frequency, and duration of abuse increased the likelihood of future parasuicides. In addition, Boudewyn and Liem noted that in comparison to other childhood and adult stressors, sexual abuse was the strongest and most consistent predictor of suicidal behavior.

Another variable consistently associated with repeat parasuicide is a history of criminal behavior. Criminality has shown to be predictive of repeat parasuicide in both retrospective (Buglass & Horton, 1974b; Hjelmeland, 1996b; Kotila & Lonnqvist, 1987) and prospective (Buglass & Horton, 1974a; Kreitman & Casey, 1988; Morgan et al., 1976; Siani et al., 1979; van Egmond & Diekstra, 1990) studies, including a study on adolescents (Kotila & Lonnqvist, 1987). Perhaps related, a history of violent behavior has also consistently been shown to be associated with repetitive parasuicide (Buglass & Horton, 1974a; Dirks, 1998; Kreitman & Casey, 1988).

Other life event variables shown to be associated with repeat parasuicide, although not as consistently as those above, include a suicide attempt by a family member or friend (Hjelmeland, 1996b; Krarup et al., 1991; Reynolds & Eaton, 1986), separation of parents (van Egmond & Diekstra, 1990), self-reported "unhappy childhood" (Krarup et al., 1991), separation from mother at a young age (Buglass & Horton, 1974a; Morgan et al., 1976), and being a victim of violence (Buglass & Horton, 1974a;

Kreitman & Casey, 1988). In addition, individuals who score higher on "current problems" scales have been shown to be more likely to repeat parasuicide (Johnsson, Ojehagen, & Traskman-Bendz, 1996; Sakinofsky & Roberts, 1990).

2.1.3 Suicidal Behavior Variables

Without question the most significant predictor of repeated parasuicidal behavior is a history of previous parasuicides. This association has been demonstrated consistently in all studies of repeat parasuicides (Bagley & Greer, 1971; Batt et al., 1998; Bille-Brahe & Jessen, 1994; Buglass & Horton, 1974a; Buglass & Horton, 1974b; Hassanyeh et al., 1989; Leon et al., 1990; Morgan et al., 1976; Morton, 1993; Owens et al., 1994; Siani et al., 1979; Suleiman, Moussa, & El-Islam, 1989; Taylor, Kent, & Huws, 1994; Wilkinson & Smeeton, 1987).

Several variables have been investigated with regards to circumstances regarding the study index parasuicide. Suicidal intent during the index episode does not appear to be strongly associated with repeated acts. While three studies have shown high suicidal intent to be associated with repeat parasuicide (Barnes, 1986; Dirks, 1998; Gispert et al., 1987), two studies found low suicidal intent to be significant (Hjelmeland et al., 1998; Tuckman, Youngman, & Kreizman, 1968), and six studies found suicidal intent to be non-significant (Bagley & Greer, 1971; Hjelmeland, 1996b; Kessel & McCulloch, 1966; Ojehagen, Regnell, & Traskman-Bendz, 1991; Suleiman, Moussa, & El-Islam, 1989; Wang, 1985). An influential result from Hjelmeland (1996a) found that verbalized intentions of wishes to die predicted future completed

suicide, but not non-fatal repetition of parasuicide.

Other index parasuicide variables that have shown to be associated with repeated parasuicide include impulsiveness of the index act (Evans, Platts, & Liebenau, 1996; Kessel & McCulloch, 1966; Ojehagen, Regnell, & Traskman-Bendz, 1991), alcohol used during the index act (Hassanyeh & Fairbairn, 1985; Kreitman & Casey, 1988), the lack of a precipitating factor for the index act (Morgan et al., 1976), the presence of a written note (Owens et al., 1994), multiple stressors contributing to the index act (Gispert et al., 1987; Hassanyeh & Fairbairn, 1985), and regretting surviving the index act (Morgan et al., 1976).

Sakinofsky and Roberts (1990) found that a first parasuicide at a young age was also significantly associated with repeat parasuicidal behavior.

2.1.4 Psychiatric Variables

Many psychiatric characteristics of parasuicidal individuals have been studied in association with repeat parasuicides. It has been shown that the presence of any psychiatric disorder significantly increases the likelihood of repetition among a population of parasuiciders (Barnes, 1986; Kotila & Lonnqvist, 1987; Tuckman, Youngman, & Kreizman, 1968). More specifically, however, several specific psychiatric disorders have been found to be strongly linked to repetitive parasuicidal behavior.

Substance abuse has been shown to be strongly predictive of repeat parasuicides. Alcohol abuse has been consistently significantly associated with repeat parasuicides in many studies spanning three decades (Batt et al., 1998; Buglass & Horton, 1974a; Hjelmeland, 1996b; Kessel & McCulloch, 1966; Kotila & Lonnqvist, 1987; Kreitman & Casey, 1988; Morgan et al., 1976; Reynolds & Eaton, 1986; Sakinofsky & Roberts, 1990; Suleiman, Moussa, & El-Islam, 1989; van Egmond & Diekstra, 1990), and drug abuse has shown the same consistent pattern (Buglass & Horton, 1974b; Hjelmeland, 1996b; Kessel & McCulloch, 1966; Kotila & Lonnqvist, 1987; Kreitman & Casey, 1988; Morgan et al., 1976; Reynolds & Eaton, 1986; Suleiman, Moussa, & El-Islam, 1989; van Egmond & Diekstra, 1990).

The presence of a personality disorder has been consistently shown to differentiate repeaters from non-repeaters (Adam et al., 1983; Bagley, 1970; Johnsson, Ojehagen, & Traskman-Bendz, 1996; Kessel & McCulloch, 1966; Kreitman & Casey, 1988; Morgan et al., 1976; Morton, 1993; Sakinofsky & Roberts, 1990; Suleiman, Moussa, & El-Islam, 1989). More specifically, several studies have found a significant association between those with an antisocial personality and repetitive parasuicides (Bagley & Greer, 1971; Buglass & Horton, 1974a; Siani et al., 1979; Stein et al., 1998; van Egmond & Diekstra, 1990; Worden & Sterling-Smith, 1973). A recent study by Dirks (1998) that focussed on personality disorders found that a borderline personality disorder was in fact the most significant personality disorder in association with repeat parasuicide even after controlling for the self-harming aspect of a borderline personality diagnosis.

Depression has been studied frequently over the past three decades with regards to repeat parasuicide and a consistent pattern has yet to emerge. In this review, six studies showed a significant association between depression and repeat parasuicide (Gispert et al., 1987; Goldston et al., 1996; Hassanyeh & Fairbairn, 1985; Reynolds & Eaton, 1986; Suleiman, Moussa, & El-Islam, 1989; Taylor, Kent, & Huws, 1994), while six studies found this association to be non-significant (Buglass & Horton, 1974a; Buglass & Horton, 1974b; Johnsson, Ojehagen, & Traskman-Bendz, 1996; Morgan et al., 1976; Petrie, Chamberlain, & Clarke, 1988; Stein et al., 1998).

Finally, Taylor, Kent, and Huws (1994) showed a strong association between post-traumatic stress disorder and repetitive parasuicidal behavior in the only study that considered this diagnosis.

2.1.5 Psychological Variables

Recently, psychological constructs have been studied in relation to acts of repeat parasuicide. Unfortunately, this is an area that has not been extensively studied and consequently few findings have been validated.

Few psychological variables have been studied in more than one study. However, three studies have shown an association between those who rate high on scales measuring hopelessness and repeat parasuicide (Brittlebank et al., 1990; Johnsson, Ojehagen, & Traskman-Bendz, 1996; Petrie, Chamberlain, & Clarke, 1988). In

addition, two studies have found low self-esteem to be predictive of repeats (Dirks, 1998; Petrie, Chamberlain, & Clarke, 1988). Finally, two studies have shown an association between those who have a poor support network and repeated parasuicidal acts (Johnsson, Ojehagen, & Traskman-Bendz, 1996; Ojehagen, Regnell, & Traskman-Bendz, 1991).

Among psychological constructs that have been proposed as significant predictors of repeat parasuicide but never validated, Brittlebank (1990) found intropunitive and extrapunitive hostility to be significant, Sakinofsky and Roberts (1990) found an internal locus of control, powerlessness, and normlessness to be significant, and Johnsson, Ojehagen, and Traskman-Bendz (1996) found social anxiety to be significant. In a retrospective study of adolescents, Stein et al. (1998) found aggressive and destructive behavior to be significant.

2.1.6 Treatment Variables

One of the most frequently studied variables that has consistently shown to be strongly predictive of repeat parasuicide is previous psychiatric treatment, both in-patient and out-patient (Buglass & Horton, 1974a; Buglass & Horton, 1974b; Dirks, 1998; Hjelmeland, 1996b; Kessel & McCulloch, 1966; Kreitman & Casey, 1988; Morgan et al., 1976; Morton, 1993; Ojehagen, Regnell, & Traskman-Bendz, 1991; Owens et al., 1994; Siani et al., 1979; Taylor,Kent, & Huws, 1994; van Egmond & Diekstra, 1990). In addition, the use of psychiatric medications has been found to be associated with repeats (Dirks, 1998; Ojehagen, Regnell, & Traskman-Bendz, 1991). Johnsson,

Ojehagen, and Traskman-Bendz (1996) also found that repeaters were more likely to have parents who had undergone psychiatric treatment.

2.2 Key Studies

One of the earliest influential studies on repeat parasuicide was done by Bagley and Greer in 1971. The importance of this prospective study was not only that the authors looked at a wide variety of variables, but also that they did so in a multivariate analysis. After controlling for many psychiatric and sociodemographic variables, they were able to identify significant predictors of repeat parasuicide, which included antisocial personality, organic brain disorder, previous attempt, being widowed, separated or divorced, and being in the higher social classes.

Another key study was done by Kreitman and Casey in 1988. This study was influential because the authors studied variables associated with repeat parasuicide across three separate cohorts (1972, 1977, 1982) and looked for variables that were significant across all three cohorts. Variables that were consistently significantly correlated with repeat parasuicide in a univariate analysis were personality disorder, alcohol and drug abuse, psychiatric treatment, living alone, being a victim of violence, violent behavior, criminality, and unemployment.

A key study in the area of repeat parasuicide (and, in fact, the broader area of suicide and parasuicide) was a meta-analysis done by van Egmond and Diekstra in 1990.

Their meta-analysis included 12 studies done prior to 1985 that had compared repeat parasuicides to non-repeating parasuicides. While most variables had only been considered in a handful of studies, the authors were still able to demonstrate consistent associations between repeat parasuicide and sociopathic personalities, frequent changes of residence, unemployment, alcohol and drug abuse, a criminal record, coming from a broken home, and previous psychiatric treatment.

Sakinofsky and Roberts reported on the significance of several psychological variables in 1990. Not only did they look at numerous psychological variables in addition to life events and sociodemographic data, they did so in a multivariate analysis. Significant predictors of repeat parasuicide were scoring high on problem scales, normlessness, long prodromal disturbance, young age of first parasuicide, older current age, male gender, low lethality in index attempt, internal locus of control, and powerlessness.

A recent study from Dirks (1998) was one of very few that considered both psychological and psychiatric variables. Although it was a retrospective study, it was also a multivariate study. Many psychological and sociodemographic variables were found to be significant in a univariate analysis; however, many of these associations disappeared under the multivariate scenario. The multivariate model for predicting repeat parasuicide included unemployment, previous psychiatric treatment, suicidal ideation, and borderline personality disorder.

An interesting study by Clark et al. (1989) investigated hypotheses that explain repeated suicidal behavior. Two hypotheses were proposed. The first is called the 'trait hypothesis'. This hypothesis suggests that it is underlying factors that predispose people to suicide attempts. For example, the predispositions may be depression, a personality disorder, or a history of abuse. The second hypothesis is called the 'crescendo hypothesis'. This hypothesis suggests that a first suicide attempt lowers one's resistance to repeating the act, and therefore each attempt predisposes the person to a further attempt. The authors studied patterns of parasuicide among individuals over time to search for evidence to support either hypothesis. They looked at binary patterns at six month intervals (parasuicide during the interval or not) over a 30 month period among 928 parasuicides to see if certain patterns were more prevalent. By analyzing the patterns mathematically, the investigators found that the trait hypothesis best fit the data. "The findings suggest that the degree of association between past and future suicide attempts would disappear if individual patient differences on predisposition to suicide attempts could somehow be measured and controlled (Clark et al., 1989, p.47)."

2.3 Predictive Scales for Repeat Parasuicide

There have been several attempts to create and validate scales that could predict repeat parasuicides among a population of people who engage in parasuicidal behaviour. These studies, while informative, highlight the difficulties of applying research results to actually predicting repeat parasuicides.

One of the first, and most influential predictive scales was created by Buglass and Horton in 1974(a). Their scale was created by studying a prospective one year cohort of 847 parasuicides and choosing variables that significantly differentiated repeaters from non-repeaters at the .001 level in a univariate analysis. The six variables included on the scale were sociopathy, problems in the use of alcohol, previous in-patient psychiatric treatment, previous out-patient psychiatric treatment, previous parasuicide, and not living with a relative. The method for using the scale was simply that any individual with one or more of the above characteristics was labeled as a positive test. Applying this scale to the original cohort gave a sensitivity of 88% and specificity of 44%. The scale was validated by Buglass and Horton on two subsequent cohorts of 910 and 1052 parasuicides, which gave sensitivities of 85% and 87%, and specificities of 39% and 44%.

The Buglass and Horton scale was validated on three occasions by other investigators. Garzotto et al. (1976) tested the scale on a one year cohort of 91 Italian parasuicides. This application of the scale gave a sensitivity of 83% and a specificity of 33%. Siani et al. (1979) tested the scale on one year cohort of 147 first-ever parasuicides. They reported a sensitivity of 83% and a specificity of 35%. Finally, Myers (1988) tested the scale on a one year cohort of 365 parasuicides. This cohort gave a sensitivity of 88% and a specificity of 44%.

While it is encouraging to see consistent results across several different cohorts, the low specificity of the Buglass and Horton scale undermines the practicality of this scale. The positive predictive values in the attempts to validate this scale ranged from 18% to 32%. Values in this range generate a significant number of false positives. The only manner to increase the positive predictive value would be to increase the specificity at the cost of sensitivity, as Myers (1988) attempted by using two or more characteristics to signal a positive test instead of one, yielding a sensitivity of 75%, a specificity of 66%, and a positive predictive value of 29%. Given the low prevalence of repeat parasuicides, specificity would have to be extremely high to increase the positive predictive value by a significant amount. This would result in a very low sensitivity, and given the seriousness of a repeat parasuicide, a low sensitivity is not desirable.

Myers (1988) reviewed other published predictive scales for repeat parasuicide and found very similar positive predictive values for all scales. He concluded that the ability to predict repeat parasuicide, as of 1988, was very poor.

Three noteworthy studies on predictive parasuicide scales have since been published. Sakinofsky and Roberts (1990) proposed a scale employing psychological predictors of repeat suicide. The nine variables in his multivariate model were higher problem scores, normlessness, longer prodromal disturbances, younger age at first parasuicide, older current age, male gender, less lethal index parasuicide, more internal locus of control, and powerlessness. This model generated a sensitivity of 81.5% and a

specificity of 77.5% with a positive predictive value of 41%. While the positive predictive value is a mild improvement over previous scales, this model has never been validated on a subsequent cohort. Kreitman and Foster (1991) proposed a scale using variables considering previous parasuicides, personality disorders, alcohol use, previous psychiatric treatment, unemployment, social class, drug abuse, a criminal record, violence, age, and civil status as predictors of repeat parasuicides. The scale was created from three cohorts and validated on two subsequent cohorts. Instead of using a positive/negative classification, they proposed a low risk/medium risk/high risk designation. While this may improve accuracy in some respects, it created a problem in that the majority of individuals were classified as "medium risk", and only approximately 40% of repeaters were classified as "high risk". Corcoran et al. (1997) recently proposed a logistic regression model for predicting repeat parasuicide. The variables included in their model included no psychiatric or psychological characteristics. The eleven variable model included previous parasuicide, alcohol used during index act, drugs used during index act, change in domestic situation near time of act, drug abuse, civil status, level of education, alcohol use, age, and gender. Using a cut-off of 0.2 probability from the logistic model gave a sensitivity of 96.1% and specificity of 81.4%. However, once again the positive predictive value was relatively low at 37%.

It appears that much work still needs to be done in the area of developing scales for predicting repeat suicidal behavior.

2.4 Problems in Repeat Parasuicide Research

There are many issues that plague research in the area of repeat parasuicide making it difficult to compare results and draw definitive conclusions about characteristics that predict future repeat parasuicide. Van Egmond and Diekstra (1990) provide a comprehensive summary of the major issues that affect comparability of research in this area. The following summary is based on their observations and the articles considered in this review.

The first issue is that a consistent definition of what constitutes a parasuicide or a suicide attempt varies considerably from one study to another. Most investigators have used their own definition, and this definition may or may not consider such factors as lethality of act and suicidal intentions. Fortunately, a proposed definition from the WHO should help bring consistency to this area. The WHO suggests that parasuicide be defined as "an act with a nonfatal outcome, in which an individual deliberately initiates a nonhabitual behavior that, without intervention by others, will cause self-harm, or deliberately ingests a substance in excess of the prescribed or generally recognized therapeutic dosage, and which is aimed at realizing changes which he/she desired via the actual or expected physical consequences".

The second issue is that variables associated with parasuicide and the definition of those variables vary considerably from one study to another. This is best demonstrated by looking at the variable "depression". In this literature review, an individual was identified as suffering from depression according to one of the

following methods: the General Health Questionnaire, the Beck Depression Inventory, the Wakefield Depression Inventory, the Zung Depression Scale, the ICD classification, a DSM diagnosis of major depressive episode, the Hamilton Rating Scale for Depression, or the Center for Epidemiologic Studies-Depression Scale. Clearly consistency is lacking in the definition of depression and the comparability of results with respect to associations between depression and repeat parasuicide is questionable, and this problem can be applied to many other variables.

The third issue regards study design. While many retrospective studies have been done, clearly this is not the most effective method of identifying predictors of future parasuicides. This is particularly important when considering variables such as psychiatric conditions, whose onset may or may not have preceded the index parasuicide. Study design also varies with regards to length of follow-up and methods of collecting follow-up data. Length of follow-up varied in this review from six months to five years, and methods of follow-up data collection ranged from self-reported to hospitalized admissions.

2.5 Quality of Evidence in this Review

The quality of evidence in this review varies considerably. Approximately half of the studies reviewed had a retrospective design, which raises serious questions about the validity of conclusions made, particularly in this field of research. In addition, many studies were of a relatively low sample size. The majority of studies used samples

ranging in size from 50 to 250. Samples of this magnitude may not be sufficiently powerful to detect significant differences between repeaters and non-repeaters, which may explain some of the conflicting evidence regarding variables such as depression.

There were many designs for choosing a sample which may or may not have been representative of the entire population of parasuicides. It is widely accepted that most sample designs will not capture all parasuicides, as there are parasuicides that will not come to the attention of a health service, where most samples are collected. Even with this limitation, some study designs will better capture the entire community than others.

The preferred design is to collect participants from all health care centers in the community. However, many studies in this review collected participants only after the individuals had been referred from the emergency department to psychiatry. While most hospitals have a policy of referring all parasuicides to psychiatry, many patients never arrive there.

The vast majority of studies into the differences between repeaters and non-repeaters of parasuicide have studied correlations between various variables and the parasuicidal behavior in a univariate analysis. Univariate analyses, however, ignore the fact that many of these variables may be highly correlated, particularly in the area of psychiatry and psychology. For example, sexual abuse is highly correlated with borderline personality disorder (Boudewyn & Liem,1995). A univariate analysis would be

unable to appreciate this correlation and consequently could not identify the true predictor of the behavior. In addition, the majority of univariate analyses in this review did not use a method which would attempt to correct for the fact that in a comparison of numerous variables, by chance alone some will be significant, such as the Bonferroni method. Multivariate analyses have the potential to distinguish the most significant variables after controlling for all others. Only five studies in this review were multivariate analyses. A multivariate analysis is essential when considering such a wide range of possible influencing factors, and is particularly useful in eliminating confounding effects that will likely appear in a dataset with numerous variables.

Overall, while there exists a relatively large body of evidence on repeat parasuicide, the quality of this evidence is not strong.

Chapter 3 - Objective, Hypotheses, and Methods

3.1 Study Objective

The objective of this study was to identify sociodemographic, life event, psychological, and psychiatric variables that significantly differentiate future repeaters of parasuicide from non-repeaters. A multivariate analysis was used to identify key predictors while controlling for the confounding effects of other variables.

3.2 Study Hypotheses

It was hypothesized that in the presence of many interrelated variables, and the complex causal pathways between these variables, many variables significantly associated with repeat parasuicide in a univariate analysis would not be significantly associated with repeat parasuicide in a multivariate analysis. Furthermore, it was hypothesized that in a multivariate analysis the more proximate (with regards to time) predictors of a repeat parasuicide would emerge as the most significant predictors. For example, it was expected that in a model with unemployment and hopelessness, the significant predictor would more likely be hopelessness, due to the possibility that unemployment may cause hopelessness. Therefore, the variables expected to be significantly associated with repeat parasuicide were depression, hopelessness, antisocial personality, substance abuse, and previous parasuicide.

3.3 Methods

3.3.1 Recruitment of Study Sample

Recruitment of the study sample took place between February 1993 and February 1994. Recruitment took place from all five Edmonton hospitals with emergency departments at that time: the Royal Alexandra Hospital, the University of Alberta Hospital, the Grey Nuns Community Hospital and Health Centre, the Misercordia Community Hospital and Health Centre, and the Charles Camsell Hospital.

Parasuicide cases were identified from emergency records from each of the five hospitals. Every weekday a records analyst at each hospital perused all admission records from the previous day (or weekend) to identify cases of parasuicide. A record was identified as a parasuicide when any ICD code for intentional self-harm was used (E950 – E959).

Given an expected follow-up rate of 80%, and a desired sample of 400 individuals, the required size of the cohort was therefore estimated to be 500 individuals. To ensure a sample of this size, the original plan was to ask each third person if they would participate in the study. However, within the first two weeks of initiating the study, it was discovered that the number of refusals and ineligible participants was much higher than expected and from that point on every eligible individual was asked to participate in the study.

3.3.2 *Inclusion and Exclusion Criteria*

Patients were eligible for the study if:

- they had been treated in an Edmonton hospital emergency department with self-inflicted injuries or had overdosed (ICD codes E950-E959)
- they were residents of Edmonton
- they were sixteen years of age or older

Patients were excluded from the study if:

- they could not be interviewed at their home within fourteen days of their index parasuicide
- they lived in an institution
- they did not speak English

3.3.3 *Initial Interview*

When an individual agreed to participate in the study, an interview was arranged to take place within two weeks of the emergency room visit for the parasuicide. Structured interviews were conducted by trained, nonclinician interviewers at the individual's home.

The bulk of the initial interview (see Appendix A) was based on the European Parasuicide Study Interview Schedule (EPSIS), which was used during the World Health Organization (WHO) Multicentre Study on Parasuicide (Kerkhof et al., 1989). The WHO study was a large scale study of parasuicide and repeat parasuicide

conducted in twelve urban centers across Europe. Several portions of the EPSIS were used for the current study in order to be able to compare results and provide consistency in the field. The EPSIS sections used were the following:

- General Interview Information – 4 items detailing the patient identification number and time and place of the interview.
- Sociodemographic Information – 19 open and closed ended questions concerning general sociodemographic information such as gender, age, marital status, living situation, employment status, education, and income.
- Circumstances of Present Parasuicide – 15 questions concerning preparation for, expected outcome of, and environment surrounding the parasuicide. For each question there were three answers to choose from.
- Precipitating Factors of Present Parasuicide – 3 open questions concerning any events that may have occurred prior to the parasuicide and may have influenced the decision to proceed with the parasuicide; 10 additional closed questions (rated no influence, minor influence, or major influence) about specific possible events or conditions that may have been factors.
- Motives for Present Parasuicide – 13 closed questions (rated no influence, minor influence, or major influence) concerning general motives for the parasuicide.
- Physical Health – 3 yes/no questions concerning the presence of physical illness and disability and 1 question rating self-perceived physical health (excellent / good / fair / poor).
- Life Events and History – 26 yes/no questions about whether certain life events had occurred during childhood, later in life, or in the year prior to the parasuicide.

- Previous Parasuicides – 1 yes/no question regarding whether there had been parasuicidal behaviour prior to the present parasuicide. If there had been previous parasuicides, additional questions were asked concerning circumstances surrounding the previous parasuicides.
- Suicidal Behavior by Models – 1 yes/no question regarding whether a loved one had ever been engaged in suicidal behaviour. If there had been 'suicidal models', additional questions were asked about who and when these events happened.
- Contact with Health Services – 11 questions (open and closed ended) regarding recent contact with physicians, psychiatrists, psychologists, etc.
- Social Support Scale – 16 questions concerning social support needed, received, or given to family and friends. Questions are rated in four categories (no, to some extent, yes, or not applicable).

For the above sections, the individual answers to questions were used in the data reduction stage of the analysis.

In addition, several other widely accepted psychological scales were used to measure other characteristics. Questionnaires assessing the following areas were appended to the above interview questionnaire. The Beck Depression Inventory (BDI), a self-reported depression scale, was used to measure the severity of depression among individuals (Beck & Steer, undated; Beck, Steer, & Garbin, 1988; Beck et al., 1961). The Beck Hopelessness Scale (BH), also self-reported, was used to measure the severity of negative attitudes regarding the future (Beck & Steer, 1988). Both the BDI and the BH were used as a measure of a trait, rather than a current state. In other

words, individuals were asked to rate according to how they felt "during the past week including today". The State-Trait Anger Scale was used to measure anger, how anger is expressed, and how anger is controlled (Spielberger, 1988). The Self-Esteem Scale was used as a self-reported measure of the individuals' self-esteem (Rosenberg, 1979). The Social Adjustment Scale was used to measure the ability to adjust in work roles, social and leisure activities, relationship with extended family, spousal relationship, parental role, and as a member of a family unit (Weissman, 1975; Weissman and Bothwell, 1976; Weissman et al., 1978; Weissman, Sholomskas, & John, 1981). Finally, the Brief Michigan Alcoholism Screening Test was used to screen for alcoholism (Pokorny et al., 1972). For each of these established scales, the summary scale score only was used for the data reduction, not the individual answers to questions.

The final section of the interview was the Quick Diagnostic Interview Schedule (Bucholz et al., 1996). The Quick Diagnostic Interview Schedule (QDIS) is a brief structured psychiatric interview based on the Diagnostic Interview Schedule (Robins et al., 1981; Robins et al., 1982) that was used to assess DSM III lifetime diagnoses for major Axis I disorders and antisocial personality disorder. Each of these diagnoses are coded as a yes or no for the presence of the disorder, and were entered individually into the data reduction stage.

At the beginning of the study, a measure of lethality of the parasuicide was also intended to be determined. However, due to difficulties of implementation (i.e., lack

of detail of information from the emergency department records), it was subsequently dropped and not recorded.

Consent was sought at the initial interview for a follow-up interview.

3.3.4 Follow-up Interview

For those subjects who consented and could be located, a follow up interview took place at the participant's home approximately twelve months following the initial interview (see Section 4.3 for details). The same series of questionnaires was administered, except that items on the following areas were excluded: circumstances, precipitating factors, and motives of present parasuicide, physical health, suicidal behaviour by models, and alcoholism. The questionnaire sections used were directed towards current psychological or psychiatric states at follow up or life events in the previous twelve months. For the purposes of the present study, the relevant information collected (see Appendix B) at this time were details of any parasuicidal behavior since the initial interview.

3.3.5 Data Management

The data from the initial and follow-up interviews were entered as separate datasets into databases (508 initial interviews, and 425 follow-up interviews). Data cleaning and verification were performed. The data files were then imported into SPSS 7.5 for statistical analysis. The section on repeat parasuicidal behaviour from the follow-up interview was merged with the initial interview by matching on subject identification

numbers. The merged data file was used for the remainder of the statistical analysis in SPSS 7.5.

3.3.6 Univariate Statistical Analysis

The goal of the data analysis was to identify those baseline characteristics measured at the initial interview which were able to significantly differentiate repeaters of parasuicide from non-repeaters. A preliminary data analysis was done to identify significant univariate predictors of repeat parasuicide; i.e., to identify predictors of repeat parasuicide without considering the confounding effects of other variables. The vast majority of questions from the interviews were closed ended and the resulting variables describing the answers to those questions were treated as categorical. The significance of the association between these variables and the likelihood of repeat parasuicide was assessed using the Pearson chi-square test. Variables were considered to be significantly associated with repeat parasuicide when the p-value was less than 0.05. The objective of this step of the analysis was to compare results to those reported in the existing body of literature in this field.

3.3.7 Data Reduction

The objective of the study was to create a multivariate model to predict repeat parasuicide. Given that there was a large amount of data for each case relative to the actual number of cases (over 300 variables for each of the 425 follow-up cases), data reduction methods were employed to decrease the number of variables that were considered for the multivariate model. The intent of the data reduction was not only to

make the creation of a model more manageable, but also to ensure that the final model contained only true predictors of repeat parasuicide and not those that appeared by chance due to an excessive number of variables being considered.

The first step of the data reduction was to create groups of questions addressing similar content or concepts. Each questionnaire item in the interview was assigned to a specific group. Some of the groupings followed the section structure of the interview, while others were collections of questions assembled from different sections of the questionnaire that concerned related information. In this way, all questionnaire items were assigned to one of twenty-four groups (detailed in Chapter 4).

Once questions were assigned to one of the groups, a statistical data reduction was done within each group using a principal components analysis (Dunteman, 1989; Kim & Mueller, 1978a; Kim & Mueller, 1978b). This method creates 'principal components' that are linear combinations of the original variables. Each principal component represented a group of highly correlated variables. By studying the weight given to each question within a given principal component, it is possible to identify which variables are the foundation of that component. For example, within the group of questions concerning substance abuse, questions about alcohol abuse were given high weight on one component, while questions about drug abuse were given high weight on a different component.

The principal components analysis was done within each of the twenty four groups of questions, which yielded thirty nine principal components. The weights, or factor loadings, for each question within each component were studied (rotated and unrotated solutions). The vast majority of components had very high factor loadings for certain questions and very low factor loadings for other questions. It was therefore relatively easy to identify which questions best described that component.

For ease of statistical manipulation and ease of interpretation, the precise factor loadings were dropped in favor of giving low factor loadings (generally less than 0.5) a zero weight and high factor loadings (generally more than 0.5) a weight of one. Each component then became a scale describing a similar group of questions with each question having equal weight. For example, a component that had six questions regarding suicidal intent with high factor loadings became a "suicidal intent scale" with each item having a score (weight) of 1. Therefore, thirty nine principal components became thirty nine scales describing various conditions, behaviours, or characteristics. Each participant was rated on these thirty nine scales based on their answers to the questions that made up each scale. These scales became the new variables for the remainder of the analysis.

In order to ascertain whether there were redundancies in the 39 new scaled variables, a principal components analysis was performed on these variables. This analysis reduced thirty nine scales to twelve principal components. However, upon inspection of the twelve principal components, it was revealed that the majority of variables had

high weights on the first principal component and none of the rest. The remaining eleven principal components had no (or few) variables with weights greater than 0.5. This analysis indicated that the majority of the thirty nine variables were strongly correlated with each other. While this information was useful for interpreting later results, it did not create meaningful variables for the statistical analysis. As a result, the thirty nine scaled variables were kept in their scaled form.

No attempt was made to rescale the components to reflect their relative importance as predictors of repeat parasuicide. The literature does not provide adequate information on this issue. Furthermore, as described below, the study variables were mostly analyzed in dichotomous form which would make rescaling redundant.

3.3.8 Dichotomization of Scaled Variables

Prior to building a multivariate model, it was decided that the scales should be dichotomized for ease of interpretation of results from a logistic regression. Some scales were already dichotomized, such as gender or lifetime history of major depression, but others had scores that ranged from zero to as high as thirteen. The decision of where to make the cutoff for the dichotomy between the low end of the scale and the high end of the scale was made partly to ensure a meaningful statistical result, but mostly to ensure that after a scale was decomposed into two categories those categories were still meaningful from a conceptual point of view. Therefore, for many scales the two categories created were scale scores of zero (e.g., answering no to all questions regarding sexual abuse) and scale scores of one and above (e.g.,

answering yes to any of the questions regarding sexual abuse). In other cases, where there was not as clear a dichotomy between zero and one, such as a suicidal intent scale, the cutoff between the low category and the high category was made at the statistical median of that scale. The new dichotomized scales were the variables that were entered into the logistic regression.

3.3.9 Logistic Regression

A logistic regression model was created with repetition of the parasuicidal behavior within twelve months as the dependent variable. The objective of using the logistic regression model was to be able to identify the most significant predictors of repeat parasuicide while controlling for other important confounders; at the same time, the logistic regression model was able to quantify the magnitude of the increase in odds of repetition associated with the presence of that predictor. In other words, the logistic regression model provided odds ratios for the significant predictors while controlling for all other significant predictors.

The first step in creating a multivariate logistic regression model was to examine each variable individually (single main effect) to ascertain whether it was univariately associated with repeat parasuicide. Those that were associated with repeat parasuicide at a 20% level of significance were considered for the multivariate model, in addition to one variable that was not significant at that level but had extensive literature suggesting it was a significant predictor (unemployment). The conservative 20% cut-

off was chosen in order not to prematurely exclude variables that may prove to be predictive in a multivariate analysis.

Two separate methods were used to create the final logistic regression model. The first method required entering variables in a certain order (to be described shortly), while in the second method variables were entered in a completely automated process. The automated process was used to ensure that no bias was introduced by the investigator during the first method.

The first method used to create the logistic regression model was to subdivide the 39 variables into four groups, created based on the second study hypothesis. The four groups were differentiated according to time. That is, the first group described variables early in an individual's life, the second group described later variables, and so on. Logistic regression analysis was done first within each group to determine the most significant predictors within that group. Variables were entered using manual forward selection. Variables were introduced alphabetically within each group. Variables were considered significant enough to remain in the model if they were significant at the 5% level, based on the Wald statistic (Kleinbaum, 1994). Furthermore, if the addition of a new variable made a current variable non-significant, then the current variable was dropped in favor of the new variable. Once key predictors from each of the four groups were determined, they were considered for the final logistic regression model. In keeping with the second study hypothesis, the variables from the groups describing recent conditions and events were considered

first, followed by variables from the groups describing earlier life events. Interaction terms were examined between all of the final significant variables in the logistic regression model. Each possible interaction term was added individually as an additional variable to the final model to assess its significance.

The second method used to create the logistic regression model was an automated forward selection process (available as a feature in SPSS 7.5). At each step in the model building process, the most significant variable not currently in the model is selected to be the next variable entered. The significance of the variable not currently in the model is then tested using the Wald statistic, which considers the significance of the variable if it were to be included in the model with the current variables. For example, if there are currently two variables in the model, the forward selection process will look at the significance of all other variables as if they were the third variable in that model; it will then select the most significant variable under that scenario. Furthermore, if the addition of a new variable makes a current variable non-significant, then the current variable is dropped in favor of the new variable. For the purposes of this analysis, variables were considered to be significant enough to be entered if they were significant at the 5% level, and existing variables were dropped from the model if they became non-significant at the 10% level.

The goodness of fit of this model was assessed using the Hosmer and Lemenshow goodness of fit statistic (Hosmer & Lemenshow, 1989). The Hosmer and Lemenshow test subdivides the sample into groups based on various combinations of the

independent variables. The test then compares the number within each group that has the dependent variable to the expected number based on the logistic regression formula. If the values from the logistic regression formula (fitted values) are close to the actual values (observed values) from the sample, resulting in a large p-value, the model is said to have good fit.

3.3.10 Assessment of Logistic Regression Model

Several methods were used to validate the results from the logistic regression model, and specifically to ensure that significant information was not lost when variables were transformed from their scaled form to a dichotomous form.

The first step in this process was to examine the linearity of the scaled variables. One of the requirements for the logistic regression model to be appropriate is that continuous independent variables must have a linear association with the logit of the dependent variable (the logit is the logarithm of the probability of repeating parasuicide divided by one minus the same probability). To check this, values for each point on the scale for each variable were plotted against the associated logit. By looking at the logit values for each point on the scale, it was visually determined whether or not there was a significant non-linear trend between values on the scale and repeat parasuicide. As no non-linear trends were evident, it was deemed appropriate to use the scales in their original form for the next step of the analysis.

To determine if there was a loss of information when variables were reduced to their dichotomous form, a logistic regression model was built with the scaled variables, again using a forward selection process. The final model logistic regression model contained only statistically significant predictors of repeat parasuicide. This set of predictors was compared to the set of predictors from the logistic regression based on only dichotomous variables.

In light of some controversy regarding the usage of logistic regression, the scaled variables were also entered into a linear regression model, again using a forward selection process. The final linear regression model contained only statistically significant predictors of repeat parasuicide. This set of predictors was compared to the set of predictors from the logistic regression based on only dichotomous variables.

4.1 Study Participation and Follow-up

During the twelve month study period, there were 2780 parasuicidal events (by 2264 individuals) that resulted in emergency visits to one of the five Edmonton hospitals. All parasuicidal patients were asked to participate in the study. See Table 4.1 for a summary of the selection process. The majority of individuals (1805) were deemed ineligible, the main reasons being that they could not be contacted within fourteen days (22%), they had been admitted for suicidal ideation only and not actual self-harm (9%), they were under the age of sixteen (9%), they were not Edmonton residents (7%), they had already joined the study (5%), or they were hospitalized due to their parasuicide for more than fourteen days (5%). There were an additional 261 individuals who could not be contacted at all during the study period. Therefore, a total of 714 individuals were eligible for the study. Of these, 203 refused to participate (28.4%). Additionally, 3 individuals agreed to participate but were unable to complete the interview. This left a study sample of 508 individuals who were interviewed in their home. However, there were 53 who did not complete all areas of the interview, particularly the QDIS which assesses psychiatric disorders (and was the last portion of the interview). This left 455 who completed the entire initial interview.

Twelve months following their initial interview, attempts were made to contact and re-interview all 508 individuals and this was accomplished for 424 (83.5%). It is the 372

Table 4.1 - Summary of Selection and Participation Process

2780	Parasuicides in Edmonton during study period	
-	1805	Ineligible
	601	Unable to interview within 14 days
	255	Suicidal ideation only (i.e., no self-harm)
	237	Under the age of sixteen
	205	Not residents of City of Edmonton
	148	Already joined the study
	146	Hospitalized for more than 14 days after parasuicide
	95	Living in institution
	50	Subject away during study period
	38	Other
	24	Non-English speaking
	6	Subject died
975	Eligible subjects	
-	261	Could not be contacted
714	Eligible subjects who were contacted	
-	203	Refused to participate
-	3	Agreed to participate but were unable to complete interview
508	Participants	
-	53	Incomplete interviews
455	Participants with completed interviews	
-	83	Lost to follow-up
372	Participants with completed initial and follow-up information	

who completed the entire baseline interview and who were recontacted twelve months later who formed the cohort for the present study (see Section 8.5.2 for details on differences between those lost to follow-up and the study cohort).

Included in those lost to follow-up are 5 individuals who committed suicide after the initial interview but before the twelve month follow-up period was complete. They were not included in the data analysis due to the fact that they were not re-interviewed. While their inclusion in the data analysis may have been informative, their numbers were small enough that they were unlikely to have a significant impact on the results.

4.2 Descriptive Characteristics of Study Population at Initial Interview

The study population can be described using information from the baseline interview. Since these descriptive results are based on all those who completed the initial interview, this section will describe the initial cohort of 455 individuals. All further results are based on the 372 individuals from whom follow-up information on repeat parasuicide was obtained.

See Table 4.2 for a summary of major descriptive characteristics of this study population. There are several notable features. With regards to sociodemographics, females outnumbered males by slightly more than two to one. Subjects were relatively young, with two thirds of the sample being younger than 36 years of age

Table 4.2 - Descriptive Characteristics of Baseline Interview Study Sample (n=455)

Characteristic	Number	Proportion (%)
Sociodemographic:		
Gender:		
Females	307	67.5
Males	148	32.5
Age:		
16-25	167	36.7
26-35	139	30.5
36-45	98	21.5
46+	49	10.8
Marital Status:		
Single	207	45.5
Married/Common Law	132	29.0
Separated/Divorced/Widowed	116	25.5
Unemployed	116	25.5
Live Alone	91	20.3
Mental Health:		
Previous inpatient at psychiatric hospital	194	42.7
QDIS lifetime diagnoses:		
Depression	297	65.3
One of the anxiety disorders	297	65.3
Schizophrenia	65	14.3
Antisocial personality disorder	119	26.2
Alcohol abuse	183	40.2
Drug abuse	130	28.6
Life Events:		
Victim of physical abuse	278	61.2
Victim of sexual abuse	236	52.0
Longstanding physical illness or disability	184	40.4
Previous parasuicides	293	64.5

(mean age 31 years). Unemployment was common (26%), as was living alone for the year previous to the index parasuicide (20%).

With regards to mental health, a very high proportion (43%) of this parasuicide population reported having been an inpatient at a psychiatric hospital at some point in their lives. Lifetime diagnoses of mental illnesses were very common, as almost two thirds had a diagnosis of major depression and just as many had a diagnosis of one of the anxiety disorders (general anxiety disorder, panic disorder, social phobia, simple phobia, post-traumatic stress disorder, agoraphobia). Substance abuse was also common (alcohol abuse: 40%, drug abuse: 29%).

With regards to life events, large numbers of participants responded positively to questions regarding adverse life events. More than half of the participants reported being subjects of physical abuse and/or sexual abuse at some point in their life. Similarly, a large proportion of participants reported a longstanding (more than one year) physical illness or disability (40%).

Considering the high prevalence of mental illness, abuse, and physical illness in this sample of parasuicidal individuals, it is not surprising that in this population 293 participants (65%) had previous parasuicidal behaviour. The cumulative number of previous parasuicides was also high, as 124 individuals reported three or more previous parasuicidal events, and 42 individuals reported ten or more previous parasuicides.

4.3 Parasuicides During the Follow-up Period

The follow-up period for this study was twelve months. However, in many cases it was not possible to arrange an interview immediately after twelve months (i.e., 365 days). As a result, the mean time between interviews was 390.7 days (s.d. = 44.2 days).

Of the 372 who were re-interviewed after the twelve month follow-up period, 92 (24.7%) reported parasuicidal behaviour during the interval between interviews. The repeat parasuicide rate of 24.7% corresponds well with published literature on repeat parasuicide over a twelve month period. See Table 4.3 for detail on the number of repeat parasuicides. It is notable that among those who repeated their parasuicide, more than half did so more than once.

Table 4.3 – Number of repeat parasuicides in the follow-up period

Number of repeat parasuicides	Number of individuals	Proportion (%)
0	280	75.3
1	41	11.0
2	25	6.7
3	13	3.5
4	5	1.3
5	2	0.5
6	2	0.5
7	1	0.3
10	2	0.5
14	1	0.3
Total	372	100.0

The remainder of this study will describe results from the identification of the characteristics that best differentiate the 92 repeaters from the 280 who did not repeat their parasuicidal behaviour.

4.4 Univariate Data Analysis

The majority of published studies regarding repeat parasuicide have looked only at the relationship between individual variables and repeat parasuicide without controlling for the confounding effect of other variables. Although the main thrust of this study was to do a multivariate analysis in order to eliminate this source of bias, a preliminary univariate data analysis was done to confirm the results of the previously published literature. Numerous items in the questionnaire were studied to see if there was a univariate relationship between that item and repeat parasuicide. Items selected for this univariate analysis were those that have been previously reported (in published literature) as being significantly related to repeat parasuicide. The results of those univariate analyses are described in Table 4.4. Notable features of this analysis are discussed in the following sections.

4.4.1 Sociodemographic Variables

Five sociodemographic variables, extensively studied in published literature, were examined: gender, age, unemployment, marital status, and living alone.

Table 4.4 - Univariate Association with Repeat Parasuicide

Dichotomous variables (Pearson chi-square used):

Variable	Proportion who repeated (%)	Odds Ratio	95% CI for Odds Ratio	p-value
Sociodemographic:				
Gender - Male	25.4	1.05	0.63-1.75	0.849
Living Alone	38.2	2.31	1.34-3.97	0.002
Unemployed	29.8	1.40	0.81-2.40	0.225
Separated / widowed / divorced	30.4	1.48	0.87-2.50	0.144
Life Events:				
Sexual abuse	29.5	1.72	1.07-2.79	0.026
Physical abuse	27.5	1.45	0.89-2.36	0.138
Suicidal models	28.0	1.28	0.78-2.11	0.324
Suicidal Behaviour:				
Not impulsive	32.5	1.84	1.14-2.99	0.012
Suicidal intent (i.e., wanted to die)	29.6	1.59	0.99-2.55	0.054
Previous parasuicide	33.9	6.15	3.06-12.36	<0.001
Mental Health:				
QDIS alcohol abuse	29.3	1.59	0.99-2.55	0.055
QDIS drug abuse	34.6	2.00	1.22-3.30	0.006
QDIS depression	33.5	5.44	2.78-10.67	<0.001
QDIS schizophrenia	51.9	4.24	2.31-7.79	<0.001
QDIS PTSD	32.5	2.13	1.32-3.44	0.002
QDIS antisocial personality disorder	29.0	1.35	0.80-2.28	0.267
Previous in-patient at psychiatric hospital	42.0	5.27	3.14-8.85	<0.001

Continuous variables (T test used):

Variable	Mean for repeaters of parasuicide	Mean for non-repeaters	p-value
Age	32.64	29.98	0.023
MAST score (alcohol abuse)	8.40	6.22	0.025
Hopelessness	12.48	8.79	<0.001
Self esteem	43.04	39.57	<0.001

No significant association was found between gender and repeat parasuicide. There was, however, a significant association between age and repeat parasuicide, as those who repeated parasuicide were significantly older than those who did not. A significant association was also found between living alone and repeat parasuicide; living alone approximately doubled the odds of repeat parasuicide. Both unemployment and being separated, widowed, or divorced increased the odds of repeat parasuicide, but surprisingly, neither were statistically significant associations.

4.4.2 Life Event Variables

There were nine questions referring to being a victim of sexual abuse in the initial interview. Answering yes to any of those nine questions regarding sexual abuse increased the odds of repeat parasuicide by a factor of 1.72 (CI = 1.07-2.79). However, when looking at the individual questions, the most significant relationships with repeat parasuicide are found in two areas: sexual abuse by a parent during childhood (OR = 2.32 , CI = 1.06-5.06) and sexual abuse by somebody other than a family member later in life (OR = 2.23, CI = 1.35-3.67).

Being a victim of physical abuse, on the other hand, was not as strongly correlated with repeat parasuicide. Answering yes to any of the six questions regarding physical abuse increased the odds of repeat parasuicide by a factor of 1.45 (CI = 0.89-2.36). However, when individual questions are considered, physical abuse by a parent during childhood was significantly related to repeat parasuicide (OR = 1.96, CI = 1.21-3.18).

Finally, it was considered whether or not a family member or friend had engaged in suicidal behaviour before, which was not found to be significantly associated with repeat parasuicide (OR = 1.28, CI = 0.78-2.11).

4.4.3 Suicidal Behaviour Variables

Three variables concerning the circumstances surrounding the index parasuicide and previous parasuicides were considered to see if they were associated with repeat parasuicide: the impulsivity of the index parasuicide, the suicidal intent during the index parasuicide, and whether there had been a previous parasuicide.

As expected, having previously engaged in parasuicidal behaviour was significantly associated with repeating the behaviour. Having previous parasuicides increased the odds of future parasuicides during the study period by a factor of 6.15 (CI = 3.06-12.36).

Impulsivity was also significantly associated with repeat parasuicide. Those who responded that their index parasuicide was not impulsive (i.e., they had planned it) were significantly more likely to repeat their parasuicide (OR = 1.84, CI = 1.14-2.99). Similarly, those with suicidal intent (i.e., they 'wanted to die') during their index parasuicide were more likely to repeat their parasuicide (OR = 1.59, CI = 0.99-2.55).

4.4.4 *Psychiatric Variables*

Several psychiatric diagnoses were studied to see if they held a significant association with repeat parasuicide: alcohol and drug abuse, depression, schizophrenia, antisocial personality disorder, and post-traumatic stress disorder.

In accordance with most published literature, those who abused alcohol and drugs were more likely to repeat their parasuicide. The MAST scale showed that those with a repeat parasuicide had more alcohol related problems; a similar result from the QDIS showed those who abused alcohol were more likely to repeat their parasuicide (OR = 1.59, CI = 0.99-2.55). Drug abuse showed an even stronger association, as abuse of any of cannabis, stimulants, sedatives, PCP, heroin, or cocaine doubled the odds of repeat parasuicide (CI = 1.22-3.30).

In this univariate analysis, a lifetime diagnosis of depression was one of the strongest predictors of repeat parasuicide (OR = 5.44, CI = 2.78-10.67), as was schizophrenia (OR = 4.24, CI = 2.31-7.79). In addition, post-traumatic stress disorder was a strong predictor, approximately doubling the odds of repeat parasuicide. Antisocial personality disorder, however, was not significantly related to repeat parasuicide (p = 0.267).

4.4.5 *Psychological Variables*

With regards to psychological variables, hopelessness and self-esteem were studied for their univariate relationship with repeat parasuicide. Repeaters of parasuicide scored

significantly higher on both the Beck Hopelessness Scale and the Rosenberg Self Esteem Scale.

4.4.6 Treatment Variables

Finally, having been an in-patient at a psychiatric hospital was a very strong predictor of repeat parasuicide, increasing the odds of repeat parasuicide by a factor of 5.3 (CI = 3.14-8.85).

4.4.7 Summary of Univariate Analysis

Results in this section confirm many previously published results of significant associations with repeat parasuicide: living alone, being a victim of sexual abuse, extensive planning of parasuicide, strong suicidal intent, previous parasuicides, alcohol and drug abuse, depression, post-traumatic stress disorder, previous psychiatric treatment, hopelessness, and low self esteem. More importantly, however, these results emphasize the fact that there are numerous variables that are significantly associated with repeat parasuicide on a univariate basis. This suggests the possibility of numerous interactions between the different variables, and demonstrates a clear need for a multivariate analysis that will control for all the confounding effects of different variables and identify the most consequential variables.

5.1 Creation of Groups for Principal Components Analysis

Questions from the initial interview were assigned to variable groups based on existing literature. There were twenty four groups in all: gender, age, employment status, income, living alone, marital status, abuse, suicidal models, relationship with parents, previous parasuicides, suicidal intent during index parasuicide, impulsiveness of index parasuicide, motives for index parasuicide, anxiety disorders, major depression, schizophrenia, substance abuse, antisocial personality disorder, hopelessness, anger, loneliness, social adjustment, physical health, and general mental health. See Table 5.1 for actual assignment of questions to each group; see Appendix A for the labeling of each question from the questionnaire. In cases where a section of the questionnaire was based on a generally accepted and validated scale, the total score for the scale was used instead of the individual questions. This was true for the Beck Depression Inventory Scale (variable: beck), the Beck Hopelessness Scale (variable: bhtot), the State-Trait Anger Scale (variables: stan, stat1, stat2), the Rosenberg Self Esteem Scale (variable: setot), the Social Adjustment Scale (variable: socadj), and the Brief MAST (variable: mast). Psychiatric diagnoses are labeled and coded according to the results of the QDIS. Lifetime diagnoses from the QDIS were used for this study. Age was calculated based on the date of interview minus the date of birth. All other questions were entered into the principal components analysis in

Table 5.1 – Assignment of questions (or established scale scores) to 24 groups

Groups	Questions or scores
Sociodemographic	
Gender	SD1
Age	
Employment status	SD14A, SD14B
Income	SD19
Living alone	SD12, SD13
Marital status	SD5, SD6
Life Events	
Abuse	LE9A, LE9B, LE9C, LE11A, LE11B, LE11C, LE17A, LE17B, LE17C, LE22A, LE22B, LE22C, LE25A, LE25B, LE25C
Suicidal models	LE7A, LE7B, LE7C, LE13AA, LE13AB, LE13AC, LE13BA, LE13BB, LE13BC, LE18A, LE18B, LE18C, LE19A, LE19B, LE19C, SB1, SB2B1, SB2B2, SB2B3, SB2B4, SB2B5
Parents	LE1, LE2, LE5A, LE5B, LE5C, LE6A, LE6B, LE6C, LE8A, LE8B, LE8C, PF2II, LE10A, LE10B, LE10C, LE12A, LE12B, LE12C, LE14A, LE14B, LE14C
Suicidal Behaviour	
Previous attempts	PP1A, PP1B
Suicidal intent	CPP1, CPP2, CPP3, CPP4, CPP5, CPP7, CPP9, CPP10, CPP11, CPP12, CPP13, CPP14, MO7
Impulsiveness	CPP6, CPP15
Motives	MO1, MO2, MO3, MO4, MO5, MO6, MO8, MO9, MO10, MO11, MO12, MO13
Psychiatric	
Anxiety	LPAN, LGENANX, LAGORA, LSOCPHOB, LSIMPPH, LPTSD
Depression	LDEPRESS
Schizophrenia	LSCHIZ
Substance abuse	LALCOHOL, LCANNAB, LSTIM, LSEDAT, LCOCAINE, LHEROIN, LPCP, LTOBAC, MAST, PF2X, HS6D
Antisocial personality	LANTISOC
Psychological	
Hopelessness/BDI/Self Esteem	BECK, BHTOT, SETOT
Anger	STAN, STAT1, STAT2
Social Support	SS1A, SS1B, SS2A, SS2B, SS3A, SS3B, SS4A, SS4B, SS5A, SS5B, SS6A, SS6B, SS7A, SS7B, SS8A, SS8B
Loneliness	PF2I, PF2IV, PF2V, PF2VI, LE20A, LE20B, LE20C, LE21A, LE21B, LE21C, LE23A, LE23B, LE23C, LE24A, LE24B, LE24C, HS6E
Social Adjustment	SOCADJ
General Health	
Physical health	PH2VII, PH1, PH2, PH3, PH4, HS1
Mental health	PF2VIII, HS6A, HS6B, HS6C, HS4, HS8

their original form based on the coding scheme from the EPSIS questionnaire (see Appendix A).

5.2 Principal Component Analysis

A principal component analysis was performed on each group and scales (if necessary) were created for each principal component as per the methodology described in the Methods section (section 3.3). The remainder of this chapter will outline the results of both the principal component analysis for each group and the scale (if necessary) that was created. Formulas for all of the final scales can be seen in Table 5.2, and general descriptions as well as scale score ranges can be seen in Table 5.3.

5.2.1 Sociodemographic Groups

No principal components analysis was necessary for any of the sociodemographic groups due to the fact that for four of the groups there was only one relevant question (gender, age, income, marital status), and for the other two groups there were only two questions (employment status, living alone). For employment status, the question concerning current employment status was used. In addition, this was collapsed from twelve categories into two: currently unemployed or not. For living alone status, the question concerning usual living arrangements in the previous year was used. Once again, this was collapsed from an eight category question to a two category variable: lived alone or not. Finally, marital status and income were both reduced into a smaller

Table 5.2 – Formulas for New Variables

Variable	Formula
anxietyc	lpan + lgenanx + lagora + lsocphob + lsimpph + lptsd
badhome	26 - le6a - le6b - le6c - le8a - le8b - le8c - le10a - le10b - le10c - le12a - le14a - le14b - le14c
badrelat	((pf2i - 1)/2) + ((pf2vi - 1)/2) + (2 - le20b) + (2 - le20c)
drugsc	lcannab + lstim + lsedat + lcocaine + lheroin + lpcp
genmhlth	((hs4 - 1)/3) + (2 - hs6a) + (2 - hs6b) + (2 - hs6c) + (2 - hs8) + ((pf2viii - 1)/2)
impuls	cpp6 + cpp15
income	1 if less than $10,000, 2 if $10,000-$19,999, 3 if $20,000-$39,999, 4 if $40,000+
intent	cpp9 + cpp10 + cpp11 + cpp12 + cpp13 + cpp14 + (mo7 -1)
interven	cpp1 + cpp2
livalone	1 if yes to sd13
lonely	((pf2iv -1)/2) + ((pf2v - 1)/2) + (2 - le21a) + (2 - le21b) + (2 - le21c) + (2 - le23a) + (2 - le23b) + (2 - le23c) + (2 - le24a) + (2 - le24b) + (2 - le24c)
motext	mo2 + mo9 + mo10 + mo11 + mo12 - 5
motint	mo3 + mo5 + mo6 + mo8 - 4
motunb	mo1 + mo4 + mo13 - 3
noparent	6 - le1 - le2 - le5a
pabusec	12 - le9a - le9b - le9c - le22a - le22b - le22c
paramod	# of 1s in sb2b1, sb2b2, sb2b3, sb2b4, sb2b5
parsplit	8 - le5b - le5c - le12b - le12c
physhlth	((pf2vii-1)/2) + (2 - ph2) + (2 - ph3) + ((ph4 - 1)/3)
previous	same as pp1b but 4 represents 4 and higher
sabusec	18 - le11a - le11b - le11c - le17a - le17b - le17c - le25a - le25b - le25c
sepwidiv	1 if 3, 4, or 5 to sd5
stat	stat1 + stat2
suicmod	# of 2s in sb2b1, sb2b2, sb2b3, sb2b4, sb2b5
supgetfa	ss3a + ss3b - 2 (excluding 4's)
supgivfa	ss5a + ss6a + ss7a + ss8a - 4 (excluding 4's)
suppfren	ss3b + ss4b + ss5b + ss6b + ss7b + ss8b - 6 (excluding 4's)
suppneed	ss1a + ss1b + ss2a + ss2b - 4 (excluding 4's)
unemploy	1 if 4,5,or 6 to sd14a

Table 5.3 - Description of 39 Final Scaled Variables

Description of variable	Variable Name	Scale range
Unemployed	*unemploy*	0,1
Victim of sexual abuse	*sabusec*	0-9
Previous parasuicide	*previous*	0-4
Suicidal intent during index parasuicide	*intent*	0-6
Possibility of intervention during index parasuicide	*interven*	0-2
Impulsiveness of index parasuicide	*impulse*	0-2
Presence of QDIS anxiety disorders	*anxietyc*	0-6
Presence of QDIS depression	*ldepress*	0,1
Presence of QDIS schizophrenia	*lschiz*	0,1
Alcohol abuse	*mast*	0-29
Drug abuse	*drugsc*	0-6
Presence of QDIS antisocial personality	*lantisoc*	0,1
Hopelessness	*bhtot*	0-20
General mental health	*genmhlth*	0-6
Physical health	*physhlth*	0-4
Physical health compromised by index parasuicide	*ph1*	0,1
Gender	*gender*	1,2
Age	*age*	Continuous
Live alone	*livalone*	0,1
Marital status	*sepwidiv*	0,1
Victim of physical abuse	*pabusec*	0-6
Suicidal models by loved one	*suicmod*	0-5
Parasuicidal models by loved one	*paramod*	0-5
Separation from parent(s) at young age	*noparent*	0-3
Parental difficulties later in life (divorce, separation)	*parsplit*	0-4
Externally directed motives for index parasuicide	*motext*	0-5
Internally directed motives for index parasuicide	*motint*	0-4
'Unbearable situation' motive for index parasuicide	*motunb*	0-3
Social support needed	*suppneed*	0-4
Social support given to family	*supgivfa*	0-4
Social support received from family	*supgetfa*	0-2
Social support given and received with friends	*suppfren*	0-4
Social adjustment in usual roles	*socadj*	1-4
Income	*income*	1-4
Relationship with parents	*badhome*	0-13
State anger	*stan*	10-40
Trait anger	*stat*	10-40
Loneliness	*lonely*	0-11
Relationship difficulties with significant others	*badrelat*	0-4

number of categories. For marital status, the six category question was also collapsed into two categories based on published literature: separated, widowed, or divorced or not. Income was reduced from a ten category scale to a four category scale based on the statistical quartiles. Therefore, six variables emerged from the sociodemographic section: *gender*, *age*, *income*, *unemploy*, *livalone*, and *sepwidiv*.

5.2.2 Life Event Groups

There were three groups of questions that could be classified as "life events": abuse, suicidal models (i.e., suicidal behaviour among people close to the participant), and relationships with parents.

A principal components analysis was performed on the abuse group of questions, and five components emerged from this analysis. However, the weights of the questions did not lend themselves to an easy interpretation of the differences between the components. It was decided, based on published studies in the area of repeat parasuicide, that there were two clinical questions that needed to be addressed: was the participant a victim of physical abuse?, and was the participant a victim of sexual abuse? Therefore two scales (*sabusec* and *pabusec*) were created: one scale that gave a weight of one for every 'yes' response to any question regarding the participant being a victim of sexual abuse, and one scale that gave a weight of one for every 'yes' response to any question regarding the participant being a victim of physical abuse.

There were numerous questions regarding suicidal models. Once again, the principal component analysis did not seem appropriate for this section, as there were two fundamental clinical questions of interest: how many people close to you have committed suicide?, and how many people close to you have attempted suicide? Therefore two scales were created (*paramod* and *suicmod*) from the 'suicidal behaviour by models' section of the questionnaire. A weight of one was given for every parasuicide of a relative or close friend (up to five), and a weight of one was given for every suicide of a relative or close friend (up to five).

Questions regarding participants' relationship with their parents ranged from items on separation from parents at a young age to whether a participant felt that their parents did not love them. The principal components analysis was very illuminating in this section; three principal components were identified. The first component identified three questions with high weights regarding separation from parents during childhood. A scale based on positive responses to these questions was created called *noparent*. The second component identified four questions with high weights regarding marital difficulties between the participant's parents or parental divorce after childhood. A four question scale was created called *parsplit*. The third component grouped thirteen questions all concerning the environment the participant grew up in. These questions asked such questions as "did you often think your parents did not love you and did not want to take care of you?" and "have you ever been mentally mistreated by those responsible for your upbringing; by means of teasing, humiliating, etc. over prolonged periods of time?". A thirteen question scale was created named *badhome*.

5.2.3 *Suicidal Behaviour Groups*

There were three groups of questions concerning circumstances surrounding the index parasuicide, and one group concerning previous parasuicidal behaviour. There were only two questions regarding previous parasuicidal behaviour of interest, and the question chosen was the number of parasuicides in the participant's lifetime. The variable created was called *previous*.

The first group of questions concerning the index parasuicide were questions regarding the suicidal intent of the participant during the act. The principal component analysis identified two components. The first component gave high weights to questions relating to the participant's wishes to die and whether the parasuicide was a true suicide attempt. A seven question scale called *intent* was created. The second component gave high weights to questions relating to whether somebody was present or could have intervened during the index parasuicide. A two question scale called *interven* was created.

The second group of questions concerning the index parasuicide were questions regarding the impulsiveness of the act. There were only two questions regarding the extent of planning of the act, so a two question scale called *impulse* was created.

The third group of questions concerning the index parasuicide were questions regarding the participant's motives for the behaviour. The principal component

analysis identified three separate components regarding motives. The first component gave high weights to questions regarding externally directed motives (e.g., "I wanted to know if someone really cared about me"). A five question scale was created called *motext*. The second component gave high weights to questions regarding internally directed motives (e.g., "I wanted to get help from someone"). A four question scale was created called *motint*. The third component gave high weights to questions regarding motives concerning an unbearable situation (e.g., "The situation was so unbearable that I could not think of any other alternative"). A three question scale called *motunb* was created.

5.2.4 Psychiatric Groups

There were five groups of questions (diagnoses) concerning various psychiatric conditions. Three of these groups concerned only a single QDIS diagnosis: depression, schizophrenia, and antisocial personality disorder. Three variables were used for these diagnoses: *ldepress*, *lschiz*, and *lantisoc*.

The fourth group of diagnoses were comprised of a range of anxiety disorders: panic disorder, general anxiety disorder, agoraphobia, social phobias, simple phobias, and post-traumatic stress disorder. A principal component analysis grouped all of these disorders together in one component. Therefore a scale called *anxietyc* was created that gave a weight of one for each diagnosis of one of the anxiety disorders.

The last group of questions/diagnoses in the psychiatric section were those concerning substance abuse. Not surprisingly, two major components were identified by the principal component analysis. The first component gave high weights to diagnoses of drug abuse. There were six drug related diagnoses: abuse of cannabis, stimulants, sedatives, cocaine, heroin, and PCP. A scale called *drugsc* was created that gave a weight of one for each diagnosis of abuse of one of the above drug groups. The second component grouped all of the sections and diagnoses concerning alcohol abuse. The questions/diagnoses that made up this component were all very highly correlated. It was therefore decided to use the score from the MAST, since this was a scaled score itself. The variable *mast* was used to represent extent of alcohol abuse.

5.2.5 Psychological Groups

There were five groups of questions concerning psychological constructs. The first group of questions were those considering hopelessness, severity of depression, and self esteem. Each of these constructs were measured using the established score instead of the individual questions (Beck Hopelessness Scale score, Beck Depression Inventory score, and Rosenberg Self Esteem Scale score). The three scores were entered into a principal component analysis, and one component emerged. The three scores were extremely highly correlated and so it was decided to use one of the scores, the Beck Hopelessness score, since it is a widely used scale in the field of suicidal research. The variable was named *bhtot*.

The second group of questions were those concerning anger. There were three scores from the State-Trait Anger scale (based on factor analysis by D. Schopflocher). Two components emerged from the principal component analysis. The first component grouped the two scores based on trait anger. This led to a single trait anger score called *stat*. The second component was the score based on state anger. This state anger variable was called *stan*.

The third group of questions were those regarding social support. The principal component analysis on these questions identified four separate components. The first component gave high weights to questions concerning the support a participant gets from or gives to friends. This led to a six question scale called *suppfren*. The second component gave high weights to questions concerning the support a participant gives to their family. This led to a four question scale called *supgivfa*. The third component gave high weights to questions concerning the amount of support a participant feels they need. This led to a four question scale called *suppneed*. The last component gave high weights to questions concerning the support a participant gets from their family. This led to a two question scale called *supgetfa*.

The fourth group of psychological questions were those concerning loneliness and relationships. The principal component analysis identified two principal components. The first component gave large weights to questions concerning loneliness or ability to create meaningful relationships with others. A typical question was "have you ever had any problems in making friends or keeping friends?". An eleven question scale

was created called *lonely*. The second component gave large weights to questions concerning bad relationships with a partner. A four question scale was created called *badrelat*.

The last psychological construct considered was social adjustment. The Social Adjustment Scale provides a standard score. This score was used in its original form, and was entered with the name *socadj*.

5.2.6 General Health Groups

There were two groups of questions considering general health, physical health and mental health. The principal component analysis on the questions concerning physical health identified two components. The first component represented a single question: "do you have a physical illness or disability that is a consequence of your parasuicide and that is likely to affect you for a long period of time?". This variable was entered using its original questionnaire code, *ph1*. The second component gave high weights to all the questions concerning general physical health and whether the participant had a longstanding physical illness or disability. This led to a four question scale called *physhlth*. The second group of questions considered general mental health, and more specifically, mental health service utilization. All of these questions were grouped on one principal component. This led to a six question scale called *genmhlth*.

5.3 Dichotomization of Scaled Variables for Logistic Regression

The above principal component analysis resulted in 39 variables which were the basis of the logistic regression. When a dichotomous variable is entered into a logistic regression model, the logistic model provides an estimate of the odds ratio of repeat parasuicide for those who are in one category of the dichotomous variable versus those who are in the other (baseline) category. A further analysis was done (see Chapter 6) to ensure that there was not a significant loss of information by reducing a scaled variable to a dichotomous variable.

There were several variables that did not need to be dichotomized, either because they were dichotomous from the original questionnaire, or because they had been categorical questions that were reduced to two categories in the data reduction stage. Variables falling into this category were: *gender*, *lantisoc*, *ldepress*, *livalone*, *lschiz*, *ph1*, *sepwidiv*, and *unemploy*.

A second group of variables were those for whom there was an intuitive conceptual dichotomy between those who scored zero on the scale and those who scored anything but zero. For example, the most intuitive dichotomy on a scale of zero to nine measuring the extent to which a participant has been a victim of sexual abuse is the dichotomy between those who scored zero (i.e., have never been a victim of sexual abuse) and those who scored higher (i.e., have been a victim of sexual abuse). This approach was used with other scales for which this conceptual dichotomy applied.

Variables falling into this category were: *anxietyc*, *badhome*, *badrelat*, *drugsc*, *impuls*, *interven*, *noparent*, *pabusec*, *paramod*, *parsplit*, *previous*, *sabusec*, and *suicmod*.

A similar conceptual dichotomy was made for the *physhlth* variable. However, for this variable the best dichotomy was not quite between zero and higher. The *physhlth* variable was a scale from zero to four, however due to the fact that some of the questions going into the scale had more than one category, it was possible to have a score with a decimal attached (e.g., 2.67). On this scale there were 100 individuals who scored 0.33, which meant that they had responded negatively to every question regarding the presence of a longstanding physical illness or disability, but also that they had rated their overall health as "good" instead of "excellent". Therefore the *physhlth* variable was dichotomized into those who scored zero or 0.33 and those who scored higher.

The next group of variables were those for which there was not such an intuitive dichotomy between those who scored zero and those who scored higher. For these variables the dichotomy was set at the point on the scale where the statistical median was. This dichotomy created variables with approximately two equally sized groups of people (i.e., those who scored higher on the scale and those who scored lower). Variables falling into this category were: *income*, *intent*, *motext*, *motint*, *motunb*, *supgetfa*, *supgivfa*, *suppfren*, *suppneed*, *bhtot*, *socadj*, *stan*, *stat*, *lonely*, *mast*, and *genmhlth*.

The final variable was the only continuous variable in the analysis: *age*. A dichotomy was set between those who were below the median age for the cohort and those who were above the median age for the cohort.

5.4 Selection of Variables for the Logistic Regression Model Building

All thirty-nine variables in their dichotomous form were considered for the logistic regression model. Variables were initially entered into the logistic regression model individually to see if they were significant univariate predictors of repeat parasuicide. If a variable was significant at the 20% level (i.e., $p < 0.20$) it was considered further in the subsequent stages of building the logistic regression model building stage. This step eliminated eleven variables (see Table 5.4). However, one of these eleven variables, *unemploy*, has been shown in the literature to be a consistent predictor of repeat parasuicide. Therefore it was retained for the model building stage, despite its non-significance as a univariate predictor of repeat parasuicide ($p = 0.2258$). Therefore twenty-nine variables remained for the model building stage.

5.5 Logistic Regression Model Building

Logistic regression model building requires complete information on all variables for each case. In other words, if a case is missing data for any of the variables to be considered, then that case is dropped from the analysis. For this analysis, there were 29 individuals who were missing data on one of the 29 variables. Therefore 343 cases were used to build the final logistic regression model.

Table 5.4 - Univariate Significance of 39 Dichotomized Variables with Repeat Parasuicide

Variable	Odds Ratio	P-value
previous	6.15	<0.001
ldepress	5.44	<0.001
lschiz	4.24	<0.001
socadj	3.98	<0.001
genmhlth	3.34	<0.001
bhtot	2.89	<0.001
lonely	2.63	<0.001
anxietyc	2.99	<0.001
physhlth	2.80	<0.001
impuls	2.12	0.002
livalone	2.31	0.003
stan	2.09	0.003
motunb	2.09	0.004
motint	2.02	0.006
drugsc	2.00	0.006
age	1.79	0.017
sabusec	1.72	0.027
intent	1.72	0.027
stat	1.61	0.049
interven	1.59	0.075
badrelat	1.64	0.099
supgetfa	0.68	0.106
badhome	1.72	0.128
mast	1.44	0.135
pabusec	1.45	0.139
supgivfa	0.70	0.142
sepwidiv	1.48	0.145
suppfren	1.38	0.193
parsplit	1.36	0.206
income	0.74	0.225
unemploy	1.40	0.226
lantisoc	1.35	0.268
suicmod	1.28	0.325
suppneed	1.26	0.334
paramod	1.26	0.340
noparent	0.85	0.513
motext	1.16	0.536
phl	1.16	0.801
gender	0.95	0.849

Two methods were employed to build the final logistic regression model. The first was a manual process. The second process was an automated process, to ensure that an unbiased result was obtained by the first process.

The first method was to split up the remaining twenty-nine variables into four groups. The first group consisted of variables describing early life characteristics or events: *age*, *badhome*, *pabusec*, and *sabusec*. The second group consisted of variables describing characteristics or events that would have appeared later in life: *badrelat*, *livalone*, *lonely*, *physhlth*, *sepwidiv*, *supgetfa*, *supgivfa*, *suppfren*, and *unemploy*. The third group consisted of variables describing psychological or psychiatric conditions: *anxietyc*, *bhtot*, *drugsc*, *genmhlth*, *ldepress*, *lschiz*, *mast*, *socadj*, *stan*, and *stat*. The last group consisted of variables describing the index parasuicide and previous parasuicidal behaviour: *impuls*, *intent*, *interven*, *motint*, *motunb*, and *previous*.

Significant predictors of repeat parasuicide in a logistic regression model were identified from within each group (see Methods section). From the first group, only *age* remained significant in the presence of the other variables. From the second group, four variables were significant predictors in the multivariate analysis: *livalone*, *lonely*, *physhlth*, and *suppfren*. From the third group, three variables were significant: *ldepress*, *lschiz*, and *socadj*. From the last group, two variables were significant: *motint* and *previous*.

In accordance with the second study hypothesis, variables from the last two groups were entered first, as they were more likley to be more proximate conditions to the parasuicide. When the five variables (*ldepress*, *lschiz*, *socadj*, *motint*, and *previous*) were entered into a logistic regression model together, *motint* became non-significant and was dropped. In the next step, variables from the second group were considered for entry into the model now containing *ldepress*, *lschiz*, *socadj*, and *previous*. Neither *livalone*, *lonely*, or *suppfren* were significant in the presence of the four remaining variables from the previous step. However, *physhlth* was significant and caused *socadj* to become non-significant. The variable *socadj* was dropped and the model became a model with predictors of *ldepress*, *lschiz*, *physhlth*, and *previous*. The last step was to consider the variable from the first group, *age*. The variable *age* was non-significant when added to the model created in the previous step. Therefore, the final model included four significant predictors: lifetime diagnosis of depression (*ldepress*), lifetime diagnosis of schizophrenia (*lschiz*), poor physical health (*physhlth*), and previous parasuicides (*previous*).

Table 5.5 - Final logistic regression model.

Description	Variable	Odds Ratio	95% Confidence Lower Limit	95% Confidence Upper Limit	Wald p-value
Previous parasuicides	*previous*	4.10	1.83	9.21	<0.001
Schizophrenia	*lschiz*	3.34	1.67	6.68	<0.001
Depression	*ldepress*	2.54	1.23	5.26	0.012
Poor physical health	*physhlth*	2.01	1.08	3.72	0.027

The above method for selection of variables was validated using an automated forward selection process based on the 29 variables that were univariately significant in predicting repeat parasuicide. The steps in this process are illustrated in Tables 5.6(a) – 5.6(d). Using forward selection, the first variable to be entered into the logistic regression model was previous parasuicidal behaviour: *previous*.

Table 5.6(a) - Step 1 in forward selected logistic regression model.

Variable	Odds Ratio	95% Confidence Lower Limit	95% Confidence Upper Limit	Wald p-value
previous	6.87	3.18	14.81	<0.001

With *previous* in the model, the variable that was most significant as a second variable was the lifetime diagnosis of schizophrenia: *lschiz*.

Table 5.6(b) - Step 2 in forward selected logistic regression model.

Variable	Odds Ratio	95% Confidence Lower Limit	95% Confidence Upper Limit	Wald p-value
previous	6.27	2.88	13.64	<0.001
lschiz	3.68	1.88	7.17	<0.001

With *previous* and *lschiz* in the model, the variable that was most significant as a third variable was the lifetime diagnosis of depression: *ldepress*.

Table 5.6(c) - Step 3 in forward selected logistic regression model.

Variable	Odds Ratio	95% Confidence Lower Limit	95% Confidence Upper Limit	Wald p-value
previous	4.75	2.14	10.54	<0.001
lschiz	3.25	1.65	6.42	<0.001
ldepress	2.84	1.39	5.83	0.004

With *previous*, *lschiz*, and *ldepress* in the model, the variable that was most significant as a fourth variable was poor physical health, *physhlth*.

Table 5.6(d) - Step 4 in forward selected logistic regression model.

Variable	Odds Ratio	95% Confidence Lower Limit	95% Confidence Upper Limit	Wald p-value
previous	4.10	1.83	9.21	<0.001
lschiz	3.34	1.67	6.68	<0.001
ldepress	2.54	1.23	5.26	0.012
physhlth	2.01	1.08	3.72	0.027

With these four variables in the model, no other variable was significant at the 5% level as a fifth variable for this model. Therefore the final model contained four significant predictors: *ldepress*, *lschiz*, *physhlth*, and *previous*. This model matches the model created using the manual process. Table 5.7 illustrates the significance of the remaining variables if they had been added as a fifth variable to this model. Except for the social adjustment variable (*socadj*), none of the variables had a p-value smaller than 0.10. The variable *socadj*, with a p-value of 0.056, was considered as an additional variable for the model. However, the goodness of fit of the model (see

Table 5.7 – Significance of Variables when added as a fifth variable to the Final Logistic Regression Model

Variable	P-value
age	0.377
anxietyc	0.973
badhome	0.873
badrelat	0.422
bhtot	0.285
drugsc	0.192
genmhlth	0.943
impuls	0.313
intent	0.512
interven	0.667
lantisoc	0.911
livalone	0.219
lonely	0.266
mast	0.532
motint	0.113
motunb	0.411
pabusec	0.530
sabusec	0.602
sepwidiv	0.909
socadj	0.056
stan	0.929
stat	0.890
supgetfa	0.765
supgivfa	0.487
suppfren	0.271
unemploy	0.259

section 5.8) without the *socadj* variable is very good, indicating the addition of the variable would add little value. In addition, the Social Adjustment Scale is a cumbersome (21 page) questionnaire. To include this cumbersome instrument, particularly in light of the fact that little predictive value is added, would be impractical from a clinical point of view.

5.6 Interaction Terms in the Logistic Regression Model

Interaction terms were examined between all of the four variables in the model. Each possible interaction term was added individually as a fifth variable to the final model to assess its significance. No interaction terms were significant at the 5% level, and therefore the above main effects model became the final model based on dichotomous independent variables.

5.7 Suppressor Variables

It is possible that a variable that is univariately not significantly associated with repeat parasuicide may be a significant predictor in a multivariate model. It is also possible that the same variable may modify the relationship between a significant predictor and repeat parasuicide. Therefore, each of the ten variables that were eliminated as non-significant univariate predictors of repeat parasuicide (*gender*, *income*, *lantisoc*, *motext*, *noparent*, *paramod*, *parsplit*, *ph1*, *suicmod*, *suppneed*) were entered into the final logistic regression model as a fifth variable to see if their presence had a

significant effect on the model. Table 5.8 shows the significance of each of these variables if they had been the fifth variable in the model.

All of the variables, save one, had no effect when they were entered into the logistic regression model as the fifth variable. With that exception, the additional variable remained non-significant, while the four variables from the final regression model remained significant. The only variable that did not follow this pattern was the *income* variable. When *income* was entered as the fifth variable, it remained non-significant ($p = 0.6348$), however the presence of the *income* variable caused the *physhlth* variable to become non-significant ($p = 0.0930$). The likely explanation for this is that there is a strong relationship between physical health and income. Those with a longstanding physical illness or disability are less likely to be able to work full-time. Given that income was still non-significant in this model, and there is a meaningful explanation for the correlation between income and physical health, it was appropriate to drop the *income* variable and leave *physhlth* in the model.

5.8 Goodness of Fit of the Logistic Regression Model

A goodness of fit statistic was calculated to ensure that the model had overall good fit to the observed data. The Hosmer and Lemenshow test compares observed values in various groups (according to possible combination of variables) to expected (fitted) values according to the logistic regression formula. Small p-values in the Hosmer and Lemenshow test indicate a significant difference between the observed values and the

Table 5.8 – Possible Suppressor Variables when added as a fifth variable to the Final Logistic Regression Model

Variable	p-value
gender	0.742
income	0.635
lantisoc	0.914
motext	0.767
noparent	0.248
paramod	0.689
parsplit	0.580
phl	0.966
suicmod	0.735
suppneed	0.775

fitted values, and consequently indicate poor model fit. For this final logistic regression model, the Hosmer and Lemenshow test subdivided the sample into the sixteen possible combinations of the significant predictors. Observed numbers of repeaters and non-repeaters for each combination were compared to expected values based on the logistic regression formula. The test provided a non-significant result of $p = 0.330$, and therefore indicated that the logistic regression model fit the original data well. The observed and expected values are displayed in Table 5.9.

Table 5.9 – Goodness of Fit of the Final Logistic Regression Model

				Did not repeat parasuicide		Repeated parasuicide		
previous	lschiz	ldepress	physhtlh	Observed	Fitted	Observed	Fitted	Total
Yes	Yes	Yes	Yes	11	9.64	18	19.35	29
Yes	Yes	Yes	No	1	4.17	7	3.83	8
Yes	Yes	No	Yes	1	0.56	0	0.44	1
Yes	Yes	No	No	2	1.44	0	0.56	2
Yes	No	Yes	Yes	69	69.42	42	41.58	111
Yes	No	Yes	No	33	30.81	7	9.19	40
Yes	No	No	Yes	21	21.85	6	5.15	27
Yes	No	No	No	22	21.48	2	2.52	24
No	Yes	Yes	Yes	2	2.02	1	0.98	3
No	Yes	Yes	No	4	3.22	0	0.78	4
No	Yes	No	Yes	1	0.84	0	0.16	1
No	Yes	No	No	3	3.65	1	0.35	4
No	No	Yes	Yes	21	20.07	2	2.93	23
No	No	Yes	No	20	22.37	4	1.63	24
No	No	No	Yes	27	27.42	2	1.58	29
No	No	No	No	42	40.83	0	1.17	42

Chi-square = 15.73 df = 14 p-value = 0.330

Chapter 6 – Assessment of Logistic Regression

Prior to building the logistic regression model, variables were reduced from their scale form to a dichotomous form. While this step ensures results that are more easily interpreted, it introduces the possibility that valuable information will be lost when variables are reduced. Therefore, validating the dichotomization decision is a fundamental step in confirming the validity of the logistic regression model. In addition, there is some controversy over whether the logistic regression equation is as robust as the linear regression equation. In this chapter, results from a logistic regression and a linear regression using the variables in their original scaled form are presented.

6.1 Assessment of Linearity of Scaled Variables

When variables that are non-dichotomous are entered into a logistic or linear regression equation, it is essential to ensure that there is not a significant non-linear relationship between the variable to be entered into the equation and the logit of the dependent variable, repeat parasuicide. A commonly used method for assessing linearity of variables is to plot the 'logit' function versus the values of the variable. The logit is calculated as $p / (1 - p)$ where p is the probability of the presence of the dependent variable, repeat parasuicide. For example, for the *motunb* variable scores range from zero to six; the logit is calculated for all people who scored zero, then for all people who scored one, etc. for all scores. The logit values are then plotted against

the scores. If a non-linear relationship exists between the variable and repeat parasuicide, it can be observed by assessing this graph. An example a logit plot can be seen in Figure 6.1, where the *motunb* scale scores are plotted against the logit values.

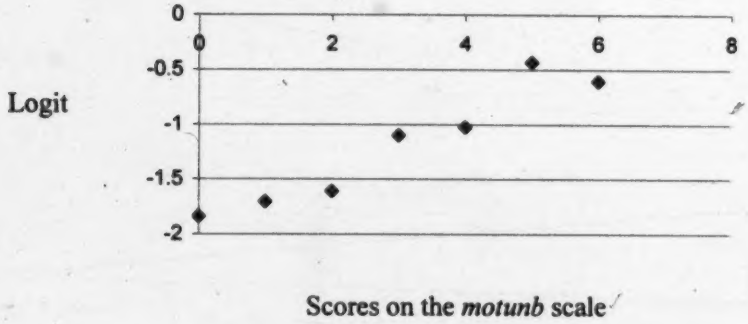
The logit plots were examined for all scaled variables. It was not necessary to look at the logits for variables that were naturally dichotomous (e.g., *ldepress*). No non-linear trends were observed in the logit plots. All variables were deemed acceptable to be entered in a logistic or linear regression equation in their scaled form.

6.2 Logistic Regression with Scaled Variables

Logistic regression can still identify significant predictors of a dichotomous dependent variable despite the fact that the independent variables may be non-dichotomous. However, the non-dichotomous nature of the independent variables precludes the usage of an easily interpreted odds ratio to describe the magnitude of the effect that variable has on the dependent variable.

The scaled variables were entered into the logistic regression model using the automated forward selection process. The variables considered for this model were the twenty-nine variables that were entered into the forward selection process for the logistic regression model using only dichotomous variables. Once again, variables were entered if they were significant at the 5% level and variables were removed if they were non-significant at the 10% level.

Figure 6.1 – Example of Logit Plot for the Variable *motunb*



The first variable entered into the logistic regression model using the forward selection process was the variable describing number of previous parasuicides: *previous* ($p < 0.001$). With *previous* in the model, the most significant variable as a second variable was the marker for schizophrenia: *lschiz* ($p = 0.003$). With *previous* and *lschiz* in the model, the most significant variable as a third variable was the marker for depression: *ldepress* ($p = 0.017$). With these three variables in the model, there were no other variables that would be significant as a fourth variable at the 5% level. However, it should be noted that if the 5% restriction was only slightly relaxed to the 5.1% level, the scale describing extent of poor physical health, *physhlth*, would have been added next to the model ($p = 0.051$). Therefore, the logistic regression model for predicting repeat parasuicide using the scaled variables instead of the dichotomous variables contained almost exactly the same predictive variables.

6.3 Linear Regression with Scaled Variables

Using slightly different criteria, linear regression will also identify the most significant predictors of a given dependent variable. Although linear regression is more commonly used for dependent variables that are continuous in nature, it can still be useful to identify predictors of a dichotomous variable. Much like the logistic regression with non-dichotomous variables, linear regression may not effectively describe the relationship between the variables and the dependent variable, but it will identify the significant predictors.

Once again, an automated forward selection process was used to build the model. The significance of variables to be entered were based on the significance of the t-statistic if that variable were entered into the current model. Variables were entered if they were significant at the 5% level, and removed if they were non-significant at the 10% level.

The first variable to be entered into the linear regression model using the forward selection process was the variable describing number of previous parasuicides: *previous* ($p < 0.001$). With *previous* in the model, the most significant variable as a second variable was the marker for schizophrenia: *lschiz* ($p = 0.001$). With *previous* and *lschiz* in the model, the most significant variable as a third variable was the scale describing extent of poor physical health: *physhlth* ($p = 0.039$). With these three variables in the model, no other variable was significant as a fourth variable at the 5% level. However, the next most significant variable, and the only remaining variable significant at the 10% level, was the marker for depression: *ldepress* ($p = 0.066$). Therefore, the linear regression model for predicting repeat parasuicide contains almost exactly the same four predictors as the logistic regression model using only dichotomous variables.

A logistic regression equation is a very useful tool for identifying significant predictors of a dichotomous variable and quantifying the magnitude of the association between the predictor and the dependent variable. In this study, four variables were identified as key predictors. However, these variables all had very high prevalence among the sample for this study. In fact, 330 participants out of 372 had at least one of the four significant predictors. In order to make the results of this study meaningful for a clinical application it was necessary to better identify which individuals were those at highest risk for repetition of their parasuicidal behaviour.

7.1 Clinical Scale

A simple scale that clinicians could quickly apply to determine whether or not a parasuicidal patient is at high risk for repeat parasuicide would be a very useful tool. Several possible scales using various weighting combinations of *previous*, *lschiz*, *ldepress*, and *physhlth* in their dichotomous form were examined. Each scale had a baseline score of zero (i.e., a subject with zero had none of the significant predictors). The objective of this exercise was to create a scale with a clear cut-off point between those at high risk for repeat parasuicide and those at lower risk for repeat parasuicide.

Given that the physical health variable was a significant predictor of repeat parasuicide in its scaled form (see Sections 6.2 and 6.3) suggests that the probability

of repeat parasuicide increases as one gets a higher score on the physical health scale. This could have been incorporated into the creation of a clinical scale, however, it was decided to use the *physhlth* variable in its dichotomous form for ease of use.

The easiest, and most effective clinical scale, was the scale that gave a weight of one for the presence of each of the four variables. There were a few reasons this scale turned out to be the most successful scale. First, the odds ratios for the four variables from the logistic regression equation were all quite similar. The magnitude of the odds ratios ranged from 2.0 to 4.1. Therefore, there is not a large difference between the effect of each of the variables. The second reason this scale was most efficient was that regardless of the weighting scheme, the group that always provided the cut-off point between the high risk and low risk group was an extremely large group of individuals (109) who were depressed, in poor physical health, and had previous parasuicidal behaviour. As a result, no matter what weighting scheme was used, this group was the first high risk group. In light of this, it was desirable then to use the least complicated scoring system possible. This scoring system gives one point for the presence of depression, one point for the presence of schizophrenia, one point for previous parasuicidal behaviour, and one point for a longstanding physical illness or disability.

That is, the scoring scheme would be as follows:

1 point – a QDIS diagnosis of a lifetime history of depression

1 point – a QDIS diagnosis of a lifetime history of schizophrenia

1 point – a positive response to the question "During your life, have you ever (previously) deliberately poisoned or injured yourself?"

1 point – a positive response to the question "Do you have any longstanding physical illness or disability that has troubled you for at least one year?" or a positive response to the question "During the two weeks before you were admitted to the hospital, did you have to cut down on any of the things you usually do because of physical illness or injury?" or a response of "major" or "minor" to the question "Did physical illness or disability have a major, minor, or no influence at all on what you did?" or a response of "poor" or "fair" to the question "Over the last three months, would you say your physical health on the whole has been excellent, good, fair or poor?"

The score as would be applied to the study cohort would be as follows:

Table 7.1 – Clinical Scale Scores vs. Repeat Parasuicide

	Repeated parasuicide		Did not repeat parasuicide		
Score	Number	Proportion (%)	Number	Proportion (%)	Total
0	0	0.0	42	100.0	42
1	9	11.1	72	88.9	81
2	15	15.5	82	84.5	97
3	50	40.7	73	59.3	123
4	18	62.1	11	37.9	29
Total	92	24.7	280	75.3	372

It is clear from the above table that the percentage of those who repeat parasuicide increases dramatically as the score increases. A test for trend indicated that this is a highly significant trend ($p < 0.0001$).

7.2 Differentiating High Risk from Low Risk Groups

With five points on the clinical scale, there are four possible points to differentiate between those at high risk for repeat parasuicide and those at low risk (i.e., between 0 and 1, between 1 and 2, between 2 and 3, and between 3 and 4). In other words, a cutoff between 1 and 2 would label those at 1 and below as low risk for repeat parasuicide, and those at 2 or higher as high risk for repeat parasuicide. Table 7.2 describes how the cohort would appear if the clinical scale was reduced to high risk versus low risk for the four possible scenarios.

Table 7.2 – Dichotomized Clinical Scores vs. Repeat Parasuicide

Cutoff	Group	Repeated parasuicide	Did not repeat	Sensitivity (%)	Specificity (%)	Positive Predictive Value (%)
Between 0 and 1	Low Risk	0	42	100.0	15.0	27.9
	High Risk	92	238			
Between 1 and 2	Low Risk	9	114	90.2	40.7	33.3
	High Risk	83	166			
Between 2 and 3	Low Risk	24	196	73.9	70.0	44.7
	High Risk	68	84			
Between 3 and 4	Low Risk	74	269	19.6	96.1	62.1
	High Risk	18	11			

Table 7.2 clearly demonstrates the trade-off between sensitivity and specificity. As sensitivity increases, specificity decreases, and vice-versa. If the cutoff for high risk versus low risk was between 0 and 1 or between 1 and 2, the sensitivity would be very high, implying that the vast majority of those who would repeat their parasuicide would be identified as high risk. However, the specificity is quite low, implying that

many people who would not repeat their parasuicide would also be labeled as high risk. If the cutoff was between 3 and 4, the specificity would be very high, implying the vast majority of those who would not repeat their parasuicide would also be labeled as low risk. But the sensitivity would be very low, implying that many of those who would repeat their parasuicide would actually be labeled as low risk. The best combination of high sensitivity and high specificity appears to be when the scale is cutoff between 2 and 3.

Using this cut-off point for differentiating high risk from low risk, we can say that a score 3 or 4 on the clinical scale increases the probability of repeat parasuicide by a factor of 4.1 over those who score 0, 1, or 2. That is, the relative risk of repeat parasuicide is 4.1 times greater for those who score 3 or 4 on the scale.

8.1 Descriptive Results and Univariate Analysis

The descriptive statistics presented in this study sample reveal the complex web of problems that parasuicide victims often face. The majority of individuals in this sample suffered from depression, the majority had an anxiety disorder, the majority had suffered from physical abuse, and the majority had suffered from sexual abuse. More than 40% were alcoholics and more than 40% reported a longstanding physical illness or disability. Members of this parasuicide population are clearly dealing with a multitude of mental and social problems. Considering the above, it is not surprising that close to two thirds of this group had previous parasuicidal behaviour. The fact that there are large prevalences across a range of disorders and life events suggests the likelihood of many interrelationships among them. For example, depression has been consistently linked with anxiety disorders, alcoholism, and sexual abuse (Waldinger, 1990). In addition, there are likely other relationships between these variables and other variables that may have been less prevalent in this group (e.g., unemployment or schizophrenia). This complex nature of relationships between different variables emphasizes the need for a multivariate analysis to identify the best predictors of repeat parasuicide.

The objective of the univariate analysis was to confirm the results generally found in the existing published literature and to ensure that this parasuicide population is

similar to most other studied parasuicide populations. There were several variables studied in this analysis and the majority confirmed reported associations. The following variables, previously found to be consistently associated with repeat parasuicide, were also found to be significantly associated with repeat parasuicide in this study: previous parasuicidal behaviour, alcohol abuse, drug abuse, being a victim of sexual abuse, post-traumatic stress disorder, hopelessness, low self-esteem, living alone, and previous psychiatric treatment.

There were, however, a few unexpected results. There were two variables that have been found to be consistently associated with repeat parasuicide in the literature that were not so in this study: unemployment and antisocial personality disorder. However, there were more unemployed who repeated their parasuicide than would be expected by chance, and there were more diagnosed with antisocial personality disorder who repeated their parasuicide than would be expected by chance, but neither of these associations were statistically significant.

Overall, it would appear that this parasuicide sample is highly representative of parasuicide populations investigated in previously reported studies.

8.2 Predictive Variables

The logistic regression model is a powerful tool for identifying predictors of a dichotomous dependent variable in a multivariate setting. It is particularly well-suited

to this study. There exists a dichotomous dependent variable (i.e., repetition of parasuicide or not), and there are numerous independent variables that may be predictive of repetition of parasuicide. Due to the strong correlations between various variables, it was desirable to use a method that would consider these associations and single out the most significant predictors of the outcome in question. Logistic regression modeling with forward selection is a method for choosing variables most significantly associated with the dependent variable in the presence of all the other variables considered up to that stage (i.e., after correlations are taken into account). In this case, there were thirty-nine variables for consideration as possible predictors, and the logistic regression technique was able to identify four significant variables. The four significant predictors identified were: previous parasuicidal behaviour, lifetime history of major depression, lifetime history of schizophrenia, and recent poor physical health.

The techniques used to identify these four predictive variables were validated on two fronts. First, the choice to dichotomize the variables was validated by performing a logistic regression on the variables in their scaled form (i.e., before dichotomization). Three of the four predictors were identified, and the fourth predictor would have been the next to enter the model if the restrictions had been slightly relaxed. Secondly, the decision to use logistic regression was validated by performing a linear regression on the scaled variables. Once again, three of the four predictors were identified, and the fourth predictor would have been the next to enter the model if the restrictions had

been slightly relaxed. The results of these validation steps support the findings of the logistic regression analysis of the dichotomized predictors.

Of the original thirty nine scaled variables, only four were significant in the final logistic regression model. The study hypothesis that many previously held associations in univariate situations would not hold true in a multivariate analysis was verified. These results suggest that many generally accepted associations with repeat parasuicide may be attributed to an association with either depression, schizophrenia, poor physical health, or previous parasuicides.

It came as no surprise that the most significant predictor (i.e., highest odds ratio) of repeat parasuicide in this study was a history of previous parasuicide. There is vast literature suggesting that previous parasuicidal behaviour is the best predictor of future parasuicidal behaviour (see Chapter 2). Even in a multivariate study it would still be expected that previous parasuicide would emerge as the best predictor. Most of the factors that would be associated with future parasuicide would likely be the same factors that would be associated with previous parasuicide. In other words, previous parasuicide may be serving as a proxy variable for the many factors that led to that behaviour in the first place. However, despite the fact that previous parasuicide may be a proxy, it remains the strongest predictor of repeat parasuicide. Previous parasuicidal behaviour increased the odds of repeat parasuicide by a factor of 4.10.

The second most significant predictor of repeat parasuicide in this study was a lifetime history of schizophrenia. A review of existing literature for this study found no studies of repeat parasuicide that considered schizophrenia as a possible predictor. This is remarkable because schizophrenia has long been considered to have an extremely strong association with suicidal behaviour. "Suicide is the single largest cause of premature death among individuals with schizophrenia (Fenton et al., 1997)." Schizophrenics are 9 times more likely to die of suicide than the general population (Harris & Barraclough, 1998). Nor is this association only between schizophrenia and completed suicide. Significant associations have been reported between schizophrenia and parasuicidal behaviour (Addington & Addington, 1992; Dyck et al., 1988). The most likely explanation for the association between schizophrenia and suicidal behaviour appears to be the prevalence of psychotic episodes in schizophrenics. Addington and Addington (1992) reported a significant association between delusions and/or hallucinations and suicidal thoughts. Nieto et al. (1992) showed that this pattern went beyond suicidal thoughts when they reported the majority of schizophrenics making serious suicide attempts were suffering from delusions and/or hallucinations at the time of their attempt. These findings suggest that schizophrenia should be a strong predictor of repeat parasuicide. Schizophrenics may be suffering from a psychotic episode during their index parasuicide, and may repeat their parasuicide during a subsequent psychotic episode. The presence of schizophrenia increased the odds of repeat parasuicide by a factor of 3.34.

The third significant predictor of repeat parasuicide was a lifetime history of major depression. Depression has been studied many times in relation to repeat parasuicide, with mixed results. Many studies have found a significant association, while many have not. However, the differences in results may be attributed to the fact that these studies have used many different methods of measuring depression. There is a well documented link between depression and suicidal behaviour. Harris and Barraclough (1998) reported that those suffering from depression are 21 times more likely to die of suicide than the general population. There is also a very strong association between depression and parasuicide (Dyck et al., 1988; Lewinsohn, 1995; Roy, 1982). Petronis et al. reported in a 1990 study that major depression increased the odds of a suicide attempt by a factor of 15. In fact, depression may be the strongest predictor of suicidal behaviour (without regard to previous suicidal behaviour). Ansis et al. (1993) reported that depression was more strongly linked to suicide attempts than any other psychiatric disorder (including anxiety disorders, schizophrenia, bipolar disorder, and alcohol or drug abuse). Similarly, De Man and Leduc (1995) reported that in adolescents the single best predictor of suicidal ideation was depression. Ecological studies have shown similar trends over the past thirty years in the prevalence of depression, suicide, and parasuicide (Diekstra, 1990; Diekstra, 1993). The manifestation of depression also fits the pattern of repeat parasuicide in that depression is relapsing in nature. It is possible that depression victims commit their parasuicide during a depressive episode, and then repeat the parasuicide during a subsequent depressive episode. In this study, the presence of depression increased the odds of repeat parasuicide by a factor of 2.54.

The last significant predictor of repeat parasuicide was poor physical health. Although physical health has not been studied in relation to repeat parasuicide, it is commonly believed to be a risk factor for suicidal behaviour in general. One of the reasons for the lack of information in this area is the difficulty defining what 'poor health' constitutes. For example, a study that suggested a link between suicide attempts and poor physical health found that a higher percentage of suicide attempters suffered from 'at least 3 somatic complaints' (Choquet & Ledoux, 1994). Nevertheless, there have been studies that have found links between poor physical health and suicide attempts (Laederach et al., 1999), and links between poor physical health and suicidal ideation (De Man & Leduc, 1995; Jin & Zhang, 1998). Recently, investigators from the WHO Multicentre Study on Parasuicide reported that almost half (48%) of the 1077 parasuicides in their study suffered from a physical illness (De Leo et al., 1999). In addition, there have been numerous studies that have shown significant associations between suicide and a specific illness (e.g., cancer or AIDS). In the present study, poor physical health was assessed based on answers to four questions. The four questions assessed: the presence of a longstanding illness or disability for more than one year, whether the individual had to cut down on usual physical activities, an overall assessment of health in the previous three months, and whether physical health was a motive for the parasuicide. These questions should give a good indication of the presence of a serious illness or disability, and perhaps more importantly, the individual's perceived state of health. Those with a longstanding illness or disability or who perceive themselves to be in poor health may perceive themselves as having a

problem that is unlikely to change over time. An inability to resolve physical health issues may increase the likelihood that an individual will repeatedly resort to parasuicidal behaviour. In this study, poor physical health increased the odds of repeat parasuicide by a factor of 2.01.

8.3 Associations Between Predictive Variables

In the logistic regression analysis only four variables were selected as significant predictors of repeat parasuicide out of a total of thirty-nine variables. This raises two questions: why were so many variables discarded, and why were these four the variables that remained?

The first question, regarding the discard of so many variables, can be relatively easily answered. An additional analysis (see Appendix C) investigated Pearson Chi-Square associations between the four predictive variables (*previous*, *lschiz*, *ldepress*, and *physhlth*) and all remaining independent variables. The results of this analysis indicate that of the thirty five remaining variables, twenty nine of them are significantly associated with one of the four predictive variables. In a logistic regression, if variables are significantly correlated then only those variables with the strongest direct relationship with the dependent variable will remain in the model. In other words, thirty three variables (four significant plus twenty nine associated variables) of the original thirty nine are so strongly correlated with each other that they can be represented by four variables. Of the remaining six variables (*suppfren*, *unemploy*,

paramod, *noparent*, *ph1*, and *gender*), none were significant univariate predictors of repeat parasuicide at the 19% level. They would be expected to be dropped in a logistic regression analysis.

It should also be noted that the remaining four variables are also associated with each other. This can be seen by comparing the odds ratios of the four variables in a univariate scenario with repeat parasuicide (see Table 5.4) to the odds ratios in the final logistic regression model (see Table 5.5). The fact that the odds ratios for all four variables decreased in each other's presence indicates that there are strong relationships between these variables. However, the fact that they remain in the final model indicates that each has a significant effect on repeat parasuicide independent of the others.

The second question, why these four variables were selected and not four others, is more difficult to answer. It is notable that two of the variables (*previous* and *ldepress*) were the two strongest univariate predictors of repeat parasuicide. In light of these strong direct relationships with repeat parasuicide, and the fact that so many other variables were strongly associated with these three variables, it seems reasonable that these variables would be likely to be selected for a logistic regression model.

The fact that every variable that is univariately significant at the 19% level is associated with either depression or previous parasuicide suggests that these variables may explain the association between other variables and repeat parasuicide, or that

these variables may be serving as a proxy for several variables. For example, the strong relationships between depression and repeat parasuicide, and depression and sexual abuse, may explain the association between sexual abuse and repeat parasuicide. Recently, Hawton et al. (1999) reported that in a study of repeat parasuicide, significant associations between repeat parasuicide and hopelessness, anger, and self-esteem all disappeared when depression was controlled for. In the case of previous parasuicides, the variable *previous* may be a proxy variable for all the events and conditions that led to that previous parasuicide in the first place, and these events and conditions may have an effect on the repeat parasuicide as well. It is also noteworthy that there is a very strong relationship between depression and previous parasuicidal behaviour. Odds ratios for both of these variables drop significantly from the univariate situation to the multivariate model.

The other two significant predictive variables in the model, the variables for schizophrenia and poor physical health, appear to be more independent predictors of repeat parasuicide. First, there are less direct relationships between these variables and the others. Secondly, the decline in the odds ratios from the univariate scenario to the multivariate scenario is less severe. This suggests a more independent effect of these variables.

8.4 The Clinical Scale

The logistic regression modeling process identified four significant predictors of repeat parasuicide: previous parasuicide, schizophrenia, depression, and poor physical health. Each of these variables are important predictors of repeat parasuicide; they each increase the odds of repeat parasuicide by at least a factor of 2. However, while they may be strong predictors, they are also very common factors in this population. Close to two thirds of this population is depressed, and close to two thirds of this population has previous parasuicidal behaviour. In fact, 330 out of the 372 study participants (89%) have at least one of these predictors present. Therefore, if these predictors were used separately to distinguish those at high risk for repeat parasuicide, then almost 9 out of every 10 people arriving at an emergency department with self-inflicted harm would be identified as being likely to repeat the act within a year. Yet we know that only 20-25% of these people will repeat. This underlines the need for a more sensitive instrument than using the four predictors separately. A simple clinical scale could solve this problem.

It seems intuitive that those with multiple problems are more likely to resort to suicidal behaviour than those with one problem. There is literature supporting this concept. Lewinsohn et al. (1995) reported that depression was the most significant psychiatric predictor of suicide attempts, but individuals with a second (comorbid) disorder were even more likely to have previous suicide attempts. Furthermore, they also found that those with three or more disorders were even more likely to have previous suicide attempts than those with just two. Similar results were reported by

Bulik et al. (1990), Laederach et al. (1999), and Wagner et al. (1996). This strongly supports the usage of a clinical scale based on the number of significant disorders an individual is suffering from. There is even evidence that comorbidity between the predictors found in the present study increases the likelihood of suicidal behaviour. Among schizophrenics, those with suicidal tendencies were more likely to be depressed, to have previous attempts, and to be suffering from a physical illness (Dassori, Mezzich, & Keshavan, 1990). It is not surprising that the present study found those suicidal tendencies also include repeat parasuicide. This evidence suggests that a clinical scale giving a weight of one for the presence of each of the predictors may be a sensitive instrument for differentiating those at high risk of repeat parasuicide from those at low risk.

The results of applying the clinical scale to the study sample indicated that this scale may be a powerful tool for predicting repeat parasuicide. There was a highly significant trend of increasing likelihood of repeat parasuicide as an individual moved higher on the scale. There is also a clear cut-off between those at high risk and those at lower risk. Scoring 3 or 4 on this clinical scale increased the odds of repeat parasuicide by a factor of 6.6.

This scale compares very favorably to other published predictive scales for repeat parasuicide. Most published predictive scales reported sensitivity, specificity, and positive predictive value of their model on their initial cohort. Therefore a direct comparison can be made with the initial cohort from this study. The sensitivity,

specificity, and positive predictive value of using a cut-off beginning at a score of 3 are similar to the best predictive scales published to date. Yet this scale has two distinct advantages. First, it is very easy to use. There are only four items, and the assessment of these four items can be done in a relatively easy manner. In addition, it is a simple additive scale where each item receives one point. The ease of use with which this scale can be applied makes it an ideal tool for usage in an emergency department setting. The second advantage of this scale is that the items making up this scale have a convincing body of literature that support their association with suicidal behaviour. There is even evidence that the combination of these conditions increases the likelihood of suicidal behaviour. The intuitive nature of using these factors to assess the possibility of repeat parasuicide makes this scale a more appealing tool.

8.5 Strengths and Limitations

There are several strengths of the study methodology that should be highlighted. In addition, there are limitations to this study design that must be acknowledged.

8.5.1 Strengths

There are three notable strengths with regards to the recruitment of the sample. The first is that the sample was collected from the entire community being studied. Participants were recruited from all City of Edmonton hospitals. Different hospitals may have different patient populations, depending on factors such as socioeconomic

status of the surrounding neighborhood. Therefore, using only a selection of hospitals in the community might have led to biased results by using a study population who may not be representative of the entire community population. By using all hospitals that service the Edmonton population, this bias was eliminated. In addition, the participants were identified as possible study participants at their first point of contact with a health service subsequent to their parasuicide (i.e., the emergency department of the hospital). Many other studies only recruit patients who have been referred to a psychiatry department, and therefore lose any patients not referred and any patients who do not follow up on this referral. A final strength is that there was no sampling done within the population of those eligible for the study. All eligible individuals were asked to participate in the study. This eliminates any systematic bias that may be introduced by study investigators asking a particular subset of individuals to join the study.

A further strength with regards to the sample is simply that it is a large sample. There were 372 individuals who completed initial and follow-up interviews. This is a much larger sample size than most published studies to date. In addition, it is a sample size that ensures that the study methodology will be powerful enough to detect any variables that increase the odds of repeat parasuicide by a factor of 2.

Another simple, yet crucial, strength is that the study has a prospective design. Participants were interviewed and data was collected prior to the follow-up period. This eliminates any bias that may be introduced by misclassifying the onset time of

any psychological or psychiatric conditions. This bias is difficult to overcome when studying parasuicidal behaviour retrospectively.

Perhaps the most important strength of the study methodology is the fact that the analysis was a multivariate analysis. The vast majority of published studies in the area of repeat parasuicide have been univariate analyses. These studies report on the strength of the association between a given variable and repeat parasuicide, without considering the confounding effects of other variables. A multivariate analysis, however, studies the strength of the association between variables and repeat parasuicide while controlling for all other significant confounders. For example, a univariate study may report a strong association between an older age and repeat parasuicide. However, this association may be simply due to the fact that older people are more likely to be depressed. In a multivariate study, age would not emerge as a significant predictor because the confounding effect of depression will have been accounted for. Considering the complexity and correlations of the many variables that may affect the likelihood of a repeat parasuicide, using a multivariate design for the analysis is a vital step in identifying the true predictors of the repeated parasuicidal behaviour.

The next study strength concerns the wide variety of variables considered as possible predictors. While there have been a handful of multivariate studies, these studies primarily looked at a certain subset of variables (e.g., a multivariate analysis of psychological predictors). This study considered many different types of variables.

Information was collected on sociodemographic information, life events, previous parasuicidal behaviour, psychological conditions, psychiatric diagnoses, general health, etc. The fact that information was collected and studied for so many different types of factors that may influence parasuicidal behaviour, combined with the fact that it was a multivariate analysis, makes this study very powerful for identifying the most influential predictors of repeat parasuicide.

A final study strength is the data reduction methods employed. The principal component analysis facilitated the reduction of more than two hundred questions into thirty-nine variables. This allowed for the retention of a large volume of information, while still maintaining a variable set that was small enough to ensure statistical relevance. In addition, the principal components method ensured that this data reduction was relatively objective.

8.5.2 Limitations

The first limitation of this study, which is common to many epidemiological studies and particularly mental health studies, is that almost all of the information is self-reported by the study participants. There is no independent measurement of the information collected on the study participants. This raises the possibility of an individual reporting false information. The first reason for this may be poor recall. Particularly in the life events section of the questionnaire, participants may not have correctly recalled events that took place during childhood or later in life. The second reason false information may be given is that the individual may have willfully

falsified information. Participants may have reached a section of the interview where they were not comfortable revealing information about themselves and subsequently gave incorrect information. There is also the possibility that participants did not take the study seriously and frivolously gave incorrect information. However, despite the possibilities of self-report biases, there is no reason to believe that this was a systematic problem and/or would have had a significant effect on the results.

A second, and likely more serious, limitation concerns the difference between the number of actual parasuicides in Edmonton during the study period and the final study sample size. There were 2780 parasuicidal events (by 2264 individuals) in Edmonton during the study period, yet only 372 individuals were considered in the final analysis. There were 2066 who were considered ineligible for the study or could not be contacted; there were 203 who refused to participate; there were 83 who were lost to follow-up.

Among those ineligible for the study, there were many who were genuinely ineligible (e.g., suicidal ideation only, under the age of sixteen, not residents of Edmonton, already joined study, etc.). However, there were 866 who could not be interviewed or contacted within 14 days, there were 146 who were hospitalized for more than 14 days due to their index parasuicide, and there were 95 who were living in institutions. It is possible that these people are systematically different from the eligible population, and that those differences could be associated with repeat parasuicide. Similarly, the 203

who refused to join the study may be different from those who agreed to join the study, and these differences may be related to repeat parasuicide.

Some emergency room data exists on those who did not become a participant in the study, making it possible to compare them with those who did participate in the study. Those who participated were compared to those who did not, and no significant differences were noted in age or marital status. There, were however, two noteworthy differences. First, those who participated in the study were more likely to be female. The second significant difference noted were in the methods used in the parasuicide. Those who did not participate in the study were much more likely to use "other methods", including alcohol.

There is much information on the 83 participants lost to follow-up. Those lost to follow-up can be compared to those who completed the follow-up interview with regards to baseline information. There were no significant differences between those who were or were not followed with regards to age, marital status and drug or alcohol abuse. Those lost to follow-up were, however, more likely to be unemployed. In addition, those lost to follow-up were more likely to be male. More importantly, however, there were no significant differences between those who were or were not lost to follow-up with regards to the significant predictors of repeat parasuicide found: depression, schizophrenia, poor physical health, and previous parasuicidal behaviour.

Finally, there are three further limitations that should be acknowledged but would not be expected to have a significant impact on the results. The first is that although this a community-based sample, it does not capture any parasuicides that do not come to the attention of one of the emergency departments. For example, a person may take an overdose of medication that they believe would be strong enough to cause death, but instead causes only side effects that do not warrant medical attention. However, once again, there is no reason to expect these people are systematically different from the hospitalized parasuicides in ways that would lead to different predicting factors of repeat parasuicide.

The second limitation is that despite a rigorous statistical analysis, there were, as always, choices that required a somewhat subjective decision to be made. However, whenever these subjective decisions were made, there were made with the intention of producing results that would be best interpretable from a psychological and psychiatric point of view.

The final limitation of the study is that there was some information lost during the data reduction stage. It is possible that a single question could be very predictive of repeat parasuicide, but when grouped with other questions, that group is not predictive. However, given the size of the sample relative to the number of actual questions in the questionnaire, it was not possible to analyze every single question on its own without the need to increase the sample size exponentially.

8.6 Future Research

The present study reported two major findings. The first finding was that the best predictors of repeat parasuicide in this cohort were previous parasuicides, schizophrenia, depression, and poor physical health. The second finding was that there appears to be an additive effect of these characteristics and a scale giving one point for each of the above predictors may be an effective method of differentiating those at high risk for repeat parasuicide from those who are at lower risk. These findings suggest two areas of future research.

The first area of future research is the validation of the scale suggested in the present study. The sensitivity, specificity, and positive predictive value of the scale on this initial cohort compares very favorably to published scales. A large independent cohort of individuals who engage in parasuicidal behaviour needs to be selected and tested on this scale to determine if the sensitivity, specificity, and positive predictive value results can be replicated. In addition, this would provide an opportunity to assess the feasibility of implementing this tool in emergency departments. For a predictive scale to be useful within this context, it needs to be accepted as an accurate and easy to use method by emergency department personnel.

A second area of future research that is suggested by the present study is to investigate the causal relationship between the many variables used in this study to understand their effect on repeat parasuicide. Numerous associations between variables were noted in the present study. There may be causal relationships between these variables

which need to be elucidated. For example, the present study suggests that depression may be a key link in a causal chain of events leading to repeat parasuicide. It would be of great benefit to be able to ascertain whether there is a causal relationship from sexual abuse to depression to repeat parasuicide.

In order to identify the causal path of events, the temporal order of events must be determined. An ideal study of causality would follow a cohort over a long period of time and determine the timing of events and timing of the onset of various conditions. Identifying the causal path of events that ultimately leads to repeat parasuicide is a crucial step in providing timely and appropriate interventions to help those in need.

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Appendix A – Initial Interview Questionnaire

PART I

GENERAL INTERVIEW INFORMATION

1. **Patient Identification/Research Centre** (7 col. / 4 col.)

   STUDY ID ORIG. INTAKE ID

2. **Name of Interviewer**

   1 sp. (number)

3. **Place of interview**

   1 sp. (number)

4. **Date and time of interview**

   First session: 6 sp. (date) 4 sp. (time started) 4 sp. (time ended)
   DATE 1 START 1 END 1

   If interview completed in two sessions

   Second session: 6 sp. (date) 4 sp. (time started) 4 sp. (time ended)
   DATE 2 START 2 END 2

SOCIO DEMOGRAPHICS. SD

SOCIO-DEMOGRAPHIC INFORMATION

"Now that you know what this interview is for and have signed the consent form, let us start with some general questions about your age, living arrangements, work or study, etc. If on any question you either cannot or do not want to give an answer, please say so. I would rather have a 'don't know' or 'don't want to say' answer than one that does not really reflect your situation or your opinion. Now before we start, do YOU have any questions?"

SD 1 **1. Gender (circle)** 1 Male / 2 Female / 3 Transsexual 1sp

SD2.A,B,C **2. "What is your date of birth?"** 2sp (day) 2sp (month) 2sp (year)

SD3 **3. "In which country were you born?"** 2sp.

SD4.A,B **4. "What is your ethnic background?"** a) 2sp. b) 2sp.

SD 5 **5. "Are you presently married or are you widowed, separated or divorced, or are you single?"**
(circle) 1 Single / 2 Married / 3 Widowed / 4 Divorced / 5 Separated / 6 Common law 1sp.

SD 6 **6. "Are you currently living with someone as though you were married (for at least three months)?"**
(circle) 1 No / 2 With male partner / 3 With female partner 1sp.

SD 7 **7. "How many times have you legally been married?"**
Number of previous marriages (including current marriage) 1sp.

SD 8 I **8. "(So you have never been / How many times have you been) divorced?"**
If SD 8 I = 0 skips to SD 9
Number of divorces 1sp.
If divorced:
"When (were you / was the last time) you divorced?"

SD 8 II A
SD 8 II B **Month and year of (last) divorce** 2sp (month) 2sp (year)

SD 9 **9. "How many times have you been living with someone, for at least three months, as though you were married (including current cohabitation)?"**

1sp. times

10 If married or living together as married:
SD 10 "How long have you been (married/living as though you were married) with your current partner?

Length of marriage/cohabitation 3sp. (months)

11 "How many children do or did you have, including children who are yours by adoption and including children of a new partner when you are remarried?" Do
SD 11 not count children who were born dead.

Number of children 2sp.

12 "With whom do you live presently (at the time you were admitted to the
SD 12 hospital)?"
Household composition at time of parasuicide. More alternatives may be applicable. 2sp.
Circle.

1. Living alone
2. Living alone with child(ren)
3. Living with partner without child(ren)
4. Living with partner and child(ren)
5. Living with parents
6. Living with other relatives/friends
7. Living in institution

SD 12 DESC 8. Other, specify 40 sp.

13 "During the past year, with whom did you live most of the time? (what was the
SD 13 usual situation)?" Household composition during part year (usual situation). More alternatives may be applicable. Circle. 2 sp.

1. Living alone
2. Living alone with child(ren)
3. Living with partner without child(ren)
4. Living with partner and child(ren)
5. Living with parents
6. Living with other relatives/friends
7. Living in institution

SD 13 DESC. 8. Other, specify 40 sp.

14 "What was your employment status at the moment you were admitted to the
SD 14 A hospital and what is/was your usual employment status?"
Patient's employment status 2 sp.
At admittance (circle): Usual
1: full-time employed (including self-employed) 1.

SD 14 B — 2 sp.

2: part-time employed (including self-employed) 2.
3: employed, temporarily off sick 3.
4: unemployed, looking for work (continue with sub 1) 4.
5: unemployed, waiting to take up job already accepted (sub 1) 5.
6: unemployed, assisting partner (continue with sub 1) 6.
7: armed services 7.
8: full-time student 8.
9: disabled, permanently sick (continue with sub 2) 9.
10: retired (continue with sub 3) 10.
11: homemaker/housewife 11.
12: other, namely 40 sp. 12.

SD14ADESC 40sp.
SD14BDESC 40sp.

SD14SUB1 Sub 1: "How long have you been unemployed?"
3sp. months

SD14SUB2 Sub 2: "How long have you been disabled?"
3sp. months

SD14SUB3 Sub 3: How long have you been retired?"
3sp. months

SD15 15 "What is your occupation? If you are unemployed or not economically active: What was your last occupation?" State if patient never had paid job.

40 sp.

16 "What is or was the occupation of your father (or stepfather, or foster father)?"

SD16A a) 40 sp.

"What is or was the occupation of your mother?" (if applicable).

SD16B b) 40 sp.

"What is or was the occupation of your partner?"

SD16 C c) 40 sp.

17 "How many times in the past year have you attended a place of worship?"

SD17 2sp. times

18 "What is the highest level of education that you have achieved?"

SD18 1sp.

1 less than Grade 9
2 Grade 9
3 Grade 9+
4 High School Graduation
5 College
6 University - Undergraduate
7 University - Post-graduate

19 "What is your family income in the past year?"

SD19 2sp.

1 less than $10,000
2 $10,000 - $19,999
3 $20,000 - $29,999
4 $30,000 - $39,999
5 $40,000 - $49,999
6 $50,000 - $59,999
7 $60,000 - $69,999
8 $70,000 - $79,999
9 $80,000 - $89,999
10 $90,000+
11 DON'T KNOW
12 REFUSED TO ANSWER

CIRCUMSTANCES OF PRESENT SUICIDE - CPP

CIRCUMSTANCES OF PRESENT PARASUICIDE

"Now, after the general questions, let us talk about the things that happened just before your admission to the hospital. Please think back to what happened and descibe as exactly as possible what led to your admission to the hospital. What did you do to yourself?"

Write out essentials. Probe with the SIS-questions in the left column below, in order to score the Suicide Intent Scale (SIS) in the right column. Only if you are completely sure about it, skip questions on which the answers are clearly implicit in patient's account of what happened. [Interviewers should make themselves familiar with the coding of the SIS in such a way that they can code all items as a result of a normal conversation. Please encourage the respondent to give a narrative of what has happened, and use the questions below as a checklist to make sure that you have covered all the relevant topics. In order to give codes you should be absolutely sure. So if you are not completely sure, use your own additional probings, or use the questions written down, in such a way that it facilitates coding.]

Concerning questions 1 to 8 on pages 7 and 8 you should give your rating, your judgement, according to your impression of the narrative of the respondent. Questions 9 to 15 concern the communications of the respondent. Please code what the respondent says, even though you might have another impression.

TO BE ASKED BY INTERVIEWER	TO BE SCORED BY INTERVIEWER. CIRCLE 0, 1 OR 2
CPP 1 1. "Was anybody near you when you tried to harm yourself? e.g. in the same room, telephone conversation."	| sp Isolation 0. Somebody present 1. Somebody nearby or in contact (e.g. telephone) 2. No one nearby or in contact
CPP 2 2. "At what moment did you do it? Were you expecting someone. Could someone soon arrive? Did you know that you had some time before anyone could arrive? Or didn't you think about the possibility?"	| sp Timing 0. Timed so that intervention is probable 1. Timed so that intervention is not likely 2. Timed so that intervention is highly unlikely
CPP 3 3. "Did you do anything to prevent that someone could find you? e.g. disconnect the telephone, put a note on the door, etc."	| sp Precautions against discovery and/or intervention 0. No precautions at all 1. Passive precautions, such as avoiding others but doing nothing to prevent their intervention (e.g. being alone in room with unlocked door) 2. Active precautions (e.g. being alone in room with door locked)
CPP 4 4. "After you harmed yourself, did you call someone to tell what you just did?"	| sp Action to gain help after the attempt 0. Notified potential helper regarding attempt 1. Contacted but did not specifically notify potential helper regarding attempt 2. Did not contact or notify helper
CPP 5 5. "Did you do anything such as paying bills, say goodbye, write a testament, once you decided to harm yourself."	| sp Final act in anticipation of death 0. None 1. Patients thought about making or made some arrangements in anticipation of death 2. Definite plans made (making up or changing a will, giving gifts, taking out insurance)

	TO BE ASKED BY INTERVIEWER:	TO BE SCORED BY INTERVIEWER: CIRCLE 0, 1 OR 2
CPP6	6. "Had you planned it for some time? Did you make any preparations such as saving pills, etc?"	Degree of planning Isp 0. No preparation (no plan) 1. Minimal or moderate preparation 2. Extensive preparation (detailed plan)
CPP7	7. "Did you write one or more farewell letters?" If yes: to whom? If no: did you think about writing one?	Suicide note (farewell letter) Isp 0. Neither written a note, nor thought about writing one 1. Thought about writing one, but had not done so 2. Presence of note, or note written but torn up
CPP8	8. "During the past year, did you tell neighbors, friends and/or family members, implicitly or explicitly, that you had the intention to harm yourself?"	Communication of intent before act Isp 0. None 1. Equivocal communication (ambiguous or implied) 2. Unequivocal communication (explicit)
CPP9	9. "Can you tell me what you hoped to accomplish by harming yourself?"	Purpose of act Isp 0. Mainly to manipulate others 1. Temporary rest 2. Death
CPP10	10 "What did you think are the chances that you would die as a result of your act?"	Expectations regarding fatality of act Isp 0. Patient thought that death was unlikely or didn't think about it 1. Patient thought that death was possible but not probable 2. Patient thought that death was probable or certain
CPP11	11 If overdose "Did you think that the amount of pills you took were more, or less, than the dose that would kill you?" (Did you have more pills?)"	Conceptions of method's lethality Isp. 0. Patient did less to him/herself than he/she thought would be lethal, or patient didn't think

TO BE ASKED BY INTERVIEWER		TO BE SCORED BY INTERVIEWER: CIRCLE 0, 1 OR 2
	Else "Did you think about other methods that would be more, or less, dangerous than what you did?"	about it |sp 1. Patient was not sure or, thought what he/she did might be lethal 2. Act exceeded or equalled what patient though was lethal
CPP12	12 "Did you consider your act to be an attempt to take your life?"	Seriousness of attempt |sp 0. Patient did not consider act to be a serious attempt to end his/her life 1. Patient was uncertain whether act was a serious attempt to end his/her life 2. Patient considered act to be a serious attempt to end his/her life
CPP13	13 "What were your feelings toward life and death? Did you want to live more strongly than you wanted to die? or didn't you care whether to live or to die?"	Ambivalence towards living |sp 0. Patient did not want to die 1. Patient did not care whether he/she lived or died 2. Patient wanted to die
CPP14	14 "What did you think were the chances to survive if you would receive medical treatment afterwards?"	Chances of survival |sp 0. Chances of survival were good if patient received medical treatment 1. Chances of survival were uncertain even if medical treatment available 2. Chances of survival were almost nil even with medical treatment
CPP15	15 "How long before your act had you decided to do it? Had you thought about it for some time or did you do it impulsively?"	Degree of premeditation |sp 0. None, impulsive 1. Act contemplated for three hours or less prior to attempt 2. Act contemplated for more than three hours before attempt

PRECIPITATING FACTORS OF PRESENT SUICIDE - PF

PRECIPITATING FACTORS OF PRESENT PARASUICIDE

1. **"What caused you to (take the pills/injure yourself)? Were there any special events or circumstances that led to your act?"**

PF 1A DESC 1. 40 sp. / Major

PF 1B DESC 2. 40 sp. / Major

PF 1C DESC 3. 40 sp. / Major

2. **"There may be many reasons why people who have problems take pills or injure themselves. Please indicate whether the problems that I will mention had a major influence on what you did, had a minor influence on what you did or had no influence at all."**

Problem checklist (read out categories, skip categories that are clearly not applicable)

		1 2 3	
P. 2 I	1. Problems with your partner	No / Minor / Major	1sp
PF 2 II	2. Problems with your parents	No / Minor / Major	1sp
PF 2 III	3. Problems with your children	No / Minor / Major	1sp
PF 2 IV	4. Feelings of loneliness	No / Minor / Major	1sp
PF 2 V	5. Problems in making or maintaining friendships and social relations	No / Minor / Major	1sp
PF 2 VI	6. Rejection by a lover	No / Minor / Major	1sp
PF 2 VII	7. Physical illness or disability	No / Minor / Major	1sp
PF 2 VIII	8. Mental illness and psychiatric symptoms	No / Minor / Major	1sp
PF 2 IX	9. Unemployment	No / Minor / Major	1sp
PF 2 X	10. Addiction (to alcohol, drugs, medicines, gambling, etc.)	No / Minor / Major	1sp.

3. **"Were there any other events or circumstances that had an influence on what you did?"**

1 sp.

If patient mentions one or more events or circumstances, specify:

PF 3A 1. _____ 3 4 / Minor / Major — if PF3A = 2 skip to PF4

PF 3B 2. _____ / Minor / Major

PF 3C 3. _____ / Minor / Major

DESC. 1 DESC. 2 DESC 3

4. **"Has your perception of your situation changed since your last attempt to injure yourself? If so, how has your perception changed - what is different?"**

PF 4 DESC 1

PF 4 DESC 2

60 sp

MOTIVES FOR PRESENT PARASUICIDE – MO

MOTIVES FOR PRESENT PARASUICIDE

1. **"Just like there can be many problems that lead people to take pills or injure themselves, there can be many different intentions for it. I will hand over to you a list of reasons, and I would like you to indicate for each reason, whether it was a reason for YOU to do what you did"**

TURN THIS PAGE AND HAND OVER BOOKLET TO THE PATIENT

Below are fourteen reasons people can have for taking pills or harming themselves. Please think back to how <u>you</u> felt before you took pills or injured yourself, and indicate to what extent these reasons applied to you. Circle NO INFLUENCE if the reason mentioned played no role in what you did. Circle MINOR INFLUENCE if the reason played a minor role, circle MAJOR INFLUENCE if the reason played a major role in what you did. There are no right or wrong answers. Please do not skip items. Do not spend too much time on any one statement. If you need help, please ask the interviewer.

<u>NOW PLEASE READ EACH STATEMENT CAREFULLY, AND CIRCLE THE ANSWER THAT APPLIES BEST TO YOU</u>

			1	2	3	
Mo 1	1.	My thoughts were so unbearable, I could not endure them any longer.	No influence /	Minor influence /	Major influence	1sp
Mo 2	2.	I wanted to show someone how much I loved him/her.	No influence /	Minor influence /	Major influence	1sp
M. 3	3.	It seemed that I lost control over myself, and I do not know why I did it.	No influence /	Minor influence	Major influence	1sp
Mo 4	4.	The situation was so unbearable that I could not think of any other alternative.	No influence /	Minor influence /	Major influence	1sp.
Mo 5	5.	I wanted to get away for a while from an unacceptable situation.	No influence /	Minor influence /	Major influence	1sp.
Mo 6	6.	I wanted others to know how desperate I felt.	No influence /	Minor influence /	Major influence	1sp.
Mo 7	7.	I wanted to die.	No influence /	Minor influence /	Major influence	1sp.
1o 8	8.	I wanted to get help from someone.	No influence /	Minor influence /	Major influence	1sp.
1. 9	9.	I wanted to know if someone really cared about me.	No influence /	Minor influence /	Major influence	1sp.

			1	2	3	
Mo 10	10.	I wanted others to pay for the way they treated me.	No influence/	Minor influence/	Major influence	Isp
Mo 11	11.	I wanted to make someone feel guilty.	No influence/	Minor influence/	Major influence	Isp
Mo 12	12.	I wanted to persuade someone to change his/her mind.	No influence/	Minor influence/	Major influence	Isp
Mo 13	13.	I wanted to make things easier for others.	No influence/	Minor influence/	Major influence	Isp

PHYSICAL HEALTH - PH

PHYSICAL HEALTH

PH1 1. "Do you have a physical illness or disability that is a consequence of your (poisoning/harming) yourself and that is likely to affect you for a long period of time?" 1 2
Circle Yes / No 1sp. If PH1 = 2, skips to PH2

If Yes:
PH1A DESC A. "What is the matter with you?"

40 sp

PH2 2. "Do you have any longstanding physical illness or disability that has troubled you for at least one year?" If PH2 = 2, skips to PH3
Circle Yes / No 1sp.
1 2

If yes:
PH2A DESC. A. "What is the matter with you?"

40 sp.

PH2B B. "How long have you had it?"

3 sp. (from birth on)

PH2C C. "Does this illness or disability limit your activities in any way?"
Circle Yes / No If PH2C = 2, skips to PH3
1 2

PH2D DESC. D. If yes: "What activities does it limit?" 40 sp.

PH3 3. "Now I would like you to think about the two weeks before you were admitted to the hospital. During these two weeks, did you have to cut down on any of the things you usually do because of physical illness or injury?"
Circle: Yes / No 1sp. If PH3 = 2, skips to PH4
1 2

If Yes:

f. JA Desc PH38

A. "What was the matter with you?" 40 sp.

B. "How many days was it in all that you had to cut down on the things you usually do (including weekends)?"

____ days 2 sp.

PH 4

4. "Over the last three months, would you say your physical health on the whole has been excellent, good, fair, or poor?"

Circle: Excellent / Good / Fair / Poor 1 sp.

1 2 3 4

BECK DEPRESSION INVENTORY SCALE - BD

BECK DEPRESSION INVENTORY SCALE

"In order to assess how you feel at this moment and how you feel about the future, I would like you to complete two questionnaires. Please read the instructions on top of the questionnaires carefully, and ask me if you have any questions."

TURN THIS PAGE AND HAND OVER BOOKLET TO THE PATIENT

On this questionnaire are groups of statements. Please read each group of statements carefully. Then pick out the one statement in each group which best represents THE WAY YOU HAVE FELT FOR THE PAST WEEK INCLUDING TODAY. If several statements in the group seem to apply equally well, circle each one. Be sure to read all the statements in each group before making your choice.

NOW READ EACH GROUP OF STATEMENTS CAREFULLY AND CIRCLE THE STATEMENT THAT BEST REPRESENTS THE WAY YOU FEEL RIGHT NOW

Entries must be in order and on appropriate space it 0 1 2 3

BD1 4 sp.

1. 0. I do not feel sad.
   1. I feel sad.
   2. I am sad all the time and I can't snap out of it.
   3. I am so sad or unhappy that I can't stand it.

BD2 4 sp.

2. 0. I am not particulary discouraged about the future.
   1. I feel discouraged about the future.
   2. I feel I have nothing to look forward to.
   3. I feel that the future is hopeless and that things cannot improve.

)3 4 sp.

3. 0. I do not feel like a failure.
   1. I feel I have failed more than the average person.
   2. As I look back on my life, all I can see is a lot of failure.
   3. I feel I am a complete failure as a person.

BD4 4 sp.

4. 0. I get as much satisfaction out of things as I used to.
   1. I don't enjoy things the way I used to.
   2. I don't get real satisfaction out of anything anymore.
   3. I am dissatisfied or bored with everything.

BD5 4 sp.

5. 0. I don't feel particulary guilty.
   1. I feel guilty a good apart of the time.
   2. I feel guilty most of the time.
   3. I feel guilty all of the time.

BD6 4 sp.

6. 0. I don't feel I am being punished.
   1. I feel I may be punished.
   2. I expect to be punished.
   3. I feel I am being punished.

BD7 4 sp.

7. 0. I don't feel disappointed in myself.
   1. I am disappointed in myself.
   2. I am disgusted with myself.
   3. I hate myself.

8. 0. I don't feel any worse that anybody else.
BD8 1. I am critical of myself for my weaknesses or mistakes. 4sp.
2. I blame myself all the time for my faults.
3. I blame myself for everything bad that happens.

9. 0. I don't have any thoughts about killing myself.
BD9 1. I have thoughts of killing myself, but I would not carry them out.
2. I would like to kill myself. 4sp.
3. I would kill myself if I had the chance.

10 0. I don't cry any more than usual.
BD10 1. I cry more now than I used to. 4sp.
2. I cry all the time now.
3. I used to be able to cry, but now I can't cry even though I want to.

11 0. I am no more irritated now than I ever am.
BD11 1. I get annoyed or irritated more easily than I used to. 4sp.
2. I feel irritated all the time now.
3. I don't get irritated at all by the things that used to irritate me.

12 0. I have not lost interest in other people.
1. I am less interested in other people than I used to be. 4sp.
BD12 2. I have lost most of my interest in other people.
3. I have lost all of my interest in other people.

13 0. I make decisions about as well as I ever did.
BD13 1. I put off making decisions more than I used to. 4sp.
2. I have greater difficulty in making decisions than before.
3. I can't make decisions at all anymore.

14 0. I don't feel I look any worse than I used to. 4sp.
BD14 1. I am worried about looking old or unattractive.
2. I feel that there are permanent changes in my appearance that make me look unattractive.
3. I believe I look ugly.

15 0. I can work as well as before. 4sp.
BD15 1. It takes an extra effort to get started at doing something.
2. I have to push myself very hard to do anything.
3. I can't do any work at all.

16 0. I can sleep as well as usual. 4sp.
1. I don't sleep as well as I used to.
BD16 2. I wake up 1-2 hours earlier than usual and find it hard to get back to sleep.
3. I wake up several hours earlier than I used to and cannot get back to sleep.

BD17 17 0. I don't get more tired than usual. 4sp.
1. I get more tired easily than I used to.
2. I get tired from doing almost anything.
3. I am too tired to do anything.

BD18 18 0. My appetite is no worse than usual.
1. My appetite is not as good as it used to be. 4sp.
2. My appetite is much worse now.
3. I have no appetite at all anymore.

BD19 19 0. I haven't lost much weight if any lately.
1. I have lost more than 5 pounds. 4sp.
2. I have lost more than 10 pounds.
3. I have lost more than 15 pounds.

BD19B I am purposely trying to lose weight by eating less. 2sp
0. No.
1. Yes.

BD20 20 0. I am no more worried about my health than usual. 4sp.
1. I am worried about physical problems such as aches and pains; or upset stomach; or constipation.
2. I am very worried about physical problems and it's hard to think of much else.
3. I am so worried about physical problems, that I cannot think about anything else.

BD21 21 0. I have not noticed any recent change in my interest in sex. 4sp.
1. I am more interested in sex than I used to be.
2. I am less interested in sex than I used to be.
3. I have lost interest in sex completely.

BECK HOPELESSNESS SCALE - BH

BECK HOPELESSNESS SCALE

Below are twenty statements regarding your future. Please read each one carefully and mark the option (TRUE or FALSE) which reflects best the way you have felt during the past week including today. Please circle the word TRUE if you agree with the statement, circle the word FALSE if you disagree. There are no right or wrong answers. Please circle TRUE or FALSE for all statements. Do not spend too much time on any one statement.

NOW PLEASE READ EACH STATEMENT CAREFULLY AND
CIRCLE EITHER TRUE OR FALSE

		1 2		
BH 1	01.	True / False	I look forward to future with hope and enthusiasm.	lsp
BH 2	02.	True / False	I might as well give up because I can't make things better for myself.	lsp
BH 3	03.	True / False	When things are going badly, I am helped by knowing they can't stay that way forever.	lsp
BH 4	04.	True / False	I can't imagine what my life would be like in 10 years.	lsp
BH 5	05.	True / False	I have enough time to accomplish the things I most want to do.	lsp
BH 6	06.	True / False	In the future, I expect to succeed in what concerns me most.	lsp
BH 7	07.	True / False	My future seems dark to me.	lsp
BH 8	08.	True / False	I expect to get more of the good things in life than the average person.	lsp
BH 9	09.	True / False	I just don't get the breaks, and there's no reason to believe I will in the future.	lsp
BH 10	10.	True / False	My past experiences have prepared me well for the future.	lsp
BH 11	11.	True / False	All I can see ahead of me is unpleasantness rather than pleasantness.	lsp
BH 12	12.	True / False	I don't expect to get what I really want.	lsp
BH 13	13.	True / False	When I look ahead to the future, I expect I will be happier than I am now.	lsp
BH 14	14.	True / False	Things just don't work out the way I want them to.	lsp
BH 15	15.	True / False	I have great faith in the future.	lsp
BH 16	16.	True / False	I never get what I want, so it is foolish to want anything.	lsp
BH 17	17.	True / False	It is very unlikely that I will get any real satisfaction in the future.	lsp
BH 18	18.	True / False	The future seems vague and uncertain to me.	lsp.
BH 19	19.	True / False	I can look forward to more good times than bad times.	lsp.
BH 20	20.	True / False	There's no use in really trying to get something I want because I probably won't get it.	lsp

LIFE EVENTS AND HISTORY – LE

LIFE EVENTS AND HISTORY

This questionnaire is meant to establish what kind of problems and events you have experienced in your life, and in which stages in your life you experienced them.

The questionnaire consists of seven sections, labelled parents, brothers and sisters, other persons important to you, and yourself. On the left side of each page there is a question, asking whether a particular event happened during your life. On the right side of each page there are three columns. Please indicate in the first column (labelled CHILDHOOD) whether the particular event happened during your childhood or not. With childhood is meant when you were a child under 15 years of age. For some events, the CHILDHOOD column is missing, because it clearly is not applicable. Indicate in the second column (labelled LATER IN LIFE) whether an event happened to you or not later in life; that is: from when you became 15 years until one year ago. In the third and last column (labelled LAST YEAR), please indicate whether an event happened during the last year (between now and one year ago).

Some events mentioned in this questionnaire may not seem applicable to you at first sight. In such cases you may skip the question. However, in case of doubt, please ask the interviewer.

Of course there can be more events of importance that happened to you and are not explicitly mentioned in the questionnaire. Please feel free to write down any event that happened in your life that had a big impact on you. Study the example below before you start with the questionnaire.

EXAMPLE

	CHILDHOOD		LATER IN LIFE		LAST YEAR	
A. Was one or both of your parents ever fired from his/her job?	Yes	No	Yes	No	Yes	No

If either your father or your mother was never fired when you were younger than 15 years, you circle No under CHILDHOOD. If one or both were fired (once or several times) when you were 15 years or older, but before one year ago, circle Yes under LATER IN LIFE. If one or both were fired during the last year - between now and one year ago - circle Yes under LAST YEAR.

Please answer all the questions but do not think too long about any particular question. If at any moment you have questions or when you feel you need help, please say so to the interviewer.

Now you can turn this page and start with the questionnaire.

PARENTS

			CHILDHOOD		LATER IN LIFE		LAST YEAR		
			1	2					
LE1	1.	Were you separated from either or both of your parents for a year or more when you were a child (younger than 15)?	Yes	No			1sp.		
LE2	2.	Were you mainly brought up by someone other than your parents (by, relatives, foster parents, or in a children's home)?	Yes	No			1sp.		
LE3A LE3B LE3C	3.	Did your father die?	Yes	No	Yes	No	Yes	No	1sp. each
LE4A LE4B LE4C	4.	Did your mother die?	Yes	No	Yes	No	Yes	No	1sp. each
LE5A LE5B LE5C	5.	Did your parents divorce (separate)?	Yes	No	Yes	No	Yes	No	1sp. each
LE6A LE6B LE6C	6.	Did you often think your parents did not love you and did not want to take care of you?	Yes	No	Yes	No	Yes	No	1sp. each
LE7A LE7B LE7C	7.	Did your father or mother die because of suicide?	Yes	No	Yes	No	Yes	No	1sp. each
LE8A LE8B LE8C	8.	Was one or both of your parents addicted to alcohol, drugs or medicines for a period of one year or more?	Yes	No	Yes	No	Yes	No	1sp. each
LE9A LE9B LE9C	9.	Were you ever seriously beaten up or otherwise physically mistreated by those responsible for your upbringing.	Yes	No	Yes	No	Yes	No	1sp. each
LE10A LE10B LE10C	10.	Have you ever been mentally mistreated by those responsible for your upbringing; by means of teasing, humiliating, etc. over prolonged periods of time?	Yes	No	Yes	No	Yes	No	1sp. each
LE11A LE11B LE11C	11.	Did your father or mother ever force you to have sexual intercourse against	Yes	No	Yes	No	Yes	No	1sp. each

your will?

LE 12 A LE 12 B LE 12 C	12.	Did your father and mother ever have serious relationship problems with each other?	1 Yes	2 No	1 Yes	2 No	1 Yes	2 No	1sp. each
LE 13 A A B C	13.	a) Has your father ever attempted suicide (without fatal outcome)?	Yes	No	Yes	No	Yes	No	1sp. each
LE 13 B A B C		b) Has your mother ever attempted suicide (without fatal outcome)?	Yes	No	Yes	No	Yes	No	1sp. each
LE 14 A B C	14.	Did you ever have a very bad relationship with one of your parents in such a way that you hated him or her?	Yes	No	Yes	No	Yes	No	1sp. each
LE 15 I A B C	15.	Is there any other problem or event in relation to your parents that influenced your life and that is not mentioned on the previous pages? (Please specify below)	Yes	No	Yes	No	Yes	No	1sp. each
LE 15 I DESC LE 15 II A B C									
LE 15 II DESC.	1.	40 sp							
			Yes	No	Yes	No	Yes	No	1sp. each
	2.	40 sp.							
			Yes	No	Yes	No	Yes	No	1sp. each.

BROTHERS AND SISTERS

			CHILDHOOD		LATER IN LIFE		LAST YEAR		
LE 16 A B C	16.	Did (one of) your brother(s) or sister(s) die?	Yes	No	Yes	No	Yes	No	1sp. each
LE 17 A B C	17.	Did (one of) your brother(s) or sister(s) force you to do or endure sexual activities against your will?	Yes	No	Yes	No	Yes	No	1sp. each
LE 18 A B C	18.	Did (one of) your brother(s) or sister(s) ever attempt suicide (without fatal outcome)?	Yes	No	Yes	No	Yes	No	1sp. each

			CHILDHOOD	LATER IN LIFE	LAST YEAR	
			1 2	1 2	1 2	
19 A B C	19.	Did (one of) your brother(s) or sister(s) die because of suicide?	Yes No	Yes No	Yes No	1 sp. each

OTHER PERSONS

			CHILDHOOD	LATER IN LIFE	LAST YEAR	
LE 20 A B C	20.	Did you ever have a long lasting bad relationship with somebody important to you?	Yes No	Yes No	Yes No	1 sp. each
LE 21 A B C	21.	Did you ever have problems in finding a life companion (because you did not know how to make contact, how to date)?	Yes No	Yes No	Yes No	1 sp. each
L 2 A B C	22.	Were you ever physically mistreated by someone who was important to you?	Yes No	Yes No	Yes No	1 sp. each

YOURSELF

			CHILDHOOD	LATER IN LIFE	LAST YEAR	
	23					
LE 23 A B C	23.	Have you ever had any problems in making friends or keeping friends?	Yes No	Yes No	Yes No	1 sp. each
LE 24 A B C	24.	Have you ever experienced loneliness over a long period (having no one to talk to, no friends or visitors, lonely even when people visit you)?	Yes No	Yes No	Yes No	1 sp. each
LE 25 A B C	25.	Have you ever been sexually assaulted by strangers, a neighbour, a relative or any other person you know (other than parents, brothers or sisters)?	Yes No	Yes No	Yes No	1 sp. each

LE 24 A B C LE 24 DESC. LE 24 DESC 26 25. Was there any other problem or event in your life that influenced you, and that was not yet mentioned on the previous pages? (Please specify below).

LE 24 DESC 1. 40 sp.

1 Yes 2 No 1 Yes 2 No 1 Yes 2 No 1 sp. each

2. 40 sp

Yes No Yes No Yes No 1 sp. each

27 26. From all events and circumstances mentioned (or recorded by you yourself), which were the three most important? which three events have most strongly influenced your life?

L 27 A 1) (MOST IMPORTANT) 40. sp.

LE 27 B 2) (SECOND MOST IMPORTANT) 40 sp.

LE 28 C 3) (THIRD MOST IMPORTANT) 40 sp.

PREVIOUS PARASUICIDES - PP

PREVIOUS PARASUICIDES

1. **"During your life, have you ever (previously) deliberately poisoned or injured yourself? For instance by taking an overdose of medicines or drugs, by cutting your wrists, by trying to hang or drown yourself, by provoking accidents involving yourself, etc. How many times have you done such things?**

PP1A Yes 1sp. No 1sp. If PP1A = 2, skips to SB1

PP1B Number of parasuicide 2sp.

IF NO PREVIOUS PARASUICIDE CONTINUE WITH MODELS SECTION ON PAGE 30

2. **Can you tell me about these happenings? Please start with the last time you previously poisoned or harmed yourself. That is: not the one last week, but the last time you did this before."**

Probe with questions for each parasuicide:
A. What did you do?
B. How long ago did it happen?
C. What happened to you? Were you treated in a general hospital?
D. Did you receive any other professional help afterwards, e.g. by a psychiatrist?

Start with last previous parasuicide (= 1) and then go back in time (2, 3, 4, 5). Only the last 5 parasuicides need to be coded.

	A. Method	PREVIOUS PARASUICIDE NUMBER 1	2	3	4	5
PP2A1	1. Poisoning	2sp.	2sp.	2sp.	2sp.	2sp.
2	2. Hanging	–	–	–	–	–
3	3. Drowning	–	–	–	–	–
4	4. Cutting	–	–	–	–	–
5	5. Jumping from height	–	–	–	–	–
	6. Jumping in front of moving vehicle	–	–	–	–	–
	7. Burning	–	–	–	–	–
	8. Firearm	–	–	–	–	–
	9. CO poisoning	–	–	–	–	–
	10. Overdose	–	–	–	–	–
	11. Multiple	–	–	–	–	–
	12. Other	–	–	–	–	–

PP2B 1 2 3 4 5 **B. Time lapse between event and present parasuicide** (hierarchically)

1. less than 1 day
2. less than 1 week
3. less than 1 month
4. less than 3 months
5. less than 12 months
6. 12 months or more

1	2	3	4	5
1sp.	1sp.	1sp.	1sp.	1sp.

PP2C 1 2 3 4 5 **C. Medical/Physical treatment**

1. None
2. General Practitioner
3. General hospital
4. Other

1	2	3	4	5
1sp.	1sp.	1sp.	1sp.	1sp.

PP2D 1 2 3 4 5 **D. Psychiatric or Mental Health treatment**

1. None
2. In-patient
3. Out-patient

1	2	3	4	5
1sp.	1sp.	1sp	1sp.	1sp.

SUICIDAL BEHAVIOUR BY MODELS - SB

SUICIDAL BEHAVIOUR BY MODELS

SB1 **"To your knowledge, has one of your relatives or close friends ever deliberately poisoned or injured his or herself? Can you tell me about it?"** Yes / No

1 2 1sp.

If SB 1 = 2, skips to STG !

Probe with questions for each model:

A. "What relation was he/she to you?"
B. "Did (relation) die as a result of this act?"
C. "How long ago did it happen?"
D. "What did he/she do?"
E. If not a relative: "Did you know this person because you met in some kind of a treatment facility?"
F. "Were you personally involved in what he/she did? By that, I mean whether you were physically present, in telephone contact, or whether you were advised immediately before or after the act."

MODEL NUMBER

		1	2	3	4	5
SB2A	A. Relationship of model to subject (model was/is subject's...)	2sp.	2sp.	2sp.	2sp.	2sp.
	1. Wife / 8. Sister					
	2. Husband / 9. Brother	–	–	–	–	–
	3. Cohabitee / 10. Grandmother	–	–	–	–	–
	4. Daughter / 11. Grandfather	–	–	–	–	–
	5. Son / 12. Other relative	–	–	–	–	–
	6. Mother / 13. Close friend	–	–	–	–	–
	7. Father	–	–	–	–	–
SB 2B	B. Type of behaviour					
	1. Parasuicide	1sp.	1sp.	1sp.	1sp.	1sp.
	2. Suicide					
SB 2C	C. Time lapse between model event and present parasuicide (hierarchically)					
	1. less than 1 day	1sp.	1sp.	1sp.	1sp.	1sp.
	2. less than 1 week	–	–	–	–	–
	3. less than 1 month	–	–	–	–	–
	4. less than 3 months	–	–	–	–	–
	5. less than 12 months	–	–	–	–	–
	6. 12 months or more	–	–	–	–	–

B2D **D. Method model event**

	2sp.	2sp.	2sp.	2sp.	2sp.
1. Poisoning					
2. Hanging	–	–	–	–	–
3. Drowning	–	–	–	–	–
4. Cutting	–	–	–	–	–
5. Jumping from height	–	–	–	–	–
6. Jumping in front of moving vehicle	–	–	–	–	–
7. Burning	–	–	–	–	–
8. Firearm	–	–	–	–	–
9. CO poisoning	–	–	–	–	–
10. Overdose	–	–	–	–	–
11. Multiple	–	–	–	–	–
12. Other	–	–	–	–	–

SB2E **E. Was contact in treatment facility?**

	1sp.	1sp.	1sp.	1sp.	1sp.
1. Yes					
2. No	–	–	–	–	–

SB2F **F. Personal involvement of subject in model's act**

	1sp.	1sp.	1sp.	1sp.	1sp.
1. Yes (physically present; in telephone contact; advised immediately before/after act)					
2. No (other)	–	–	–	–	–

PART II

STATE-TRAIT ANGER SCALE

"I would like you to complete a short questionnaire which deals with feelings of anger. There are two groups, each consisting of ten statements. The first ten statements deal with how you feel in general, the second ten statements deal with how you feel right now. Please read the instructions before you begin."

TURN THIS PAGE AND HAND OVER BOOKLET TO THE PATIENT

STATE ANGER SCALE—STG

Below are 10 statements dealing with feelings of anger. Please indicate for each statement whether, in GENERAL (how you generally feel) it applies to you ALMOST NEVER, SOMETIMES, OFTEN or ALMOST ALWAYS. Please do not skip statements. Do not think too long about any one statement.

NOW READ EACH STATEMENT AND CIRCLE THE ANSWER THAT REPRESENTS BEST HOW YOU GENERALLY FEEL

			1	2	3	4	
STG 1	01.	I have a fiery temper	Almost never /	Sometimes /	Often /	Almost always	1 sp.
STG 2	02.	I am quick-tempered	Almost never /	Sometimes /	Often /	Almost always	1 sp.
STG 3	03.	I am a hot-headed person	Almost never /	Sometimes /	Often /	Almost always	1 sp.
STG 4	04.	It makes me furious when I am criticized in front of others	Almost never /	Sometimes /	Often /	Almost always	1 sp.
STG 5	05.	I get angry when I'm slowed down by others mistakes	Almost never /	Sometimes /	Often /	Almost always	1 sp.
STG 6	06.	I feel infuriated when I do a good job and get poor evaluation	Almost never /	Sometimes /	Often /	Almost always	1 sp.
STG 7	07.	I fly off the handle	Almost never /	Sometimes /	Often /	Almost always	1 sp.
STG 8	08.	I feel annoyed when I am not given recognition for doing good work	Almost never /	Sometimes /	Often /	Almost always	1 sp
STG 9	09.	When I get mad, I say nasty things	Almost never /	Sometimes /	Often /	Almost always	1 sp.
STG 10	10.	When I get frustrated, I feel like hitting someone	Almost never /	Sometimes /	Often /	Almost always	1 sp.

NOW TURN THIS PAGE TO CONTINUE

STRN

Below are 10 other statements dealing with angry feelings. Please indicate for each statement whether NOW (how you feel at this moment) it applies to you VERY MUCH, MODERATELY SO, SOMEWHAT or NOT AT ALL. Please do not skip statements

NOW READ EACH STATEMENT AND CIRCLE THE ANSWER THAT REPRESENTS BEST HOW YOU FEEL RIGHT NOW

			1	2	3	4	
STRN 1	01.	I am furious	Not at all /	Somewhat /	Moderately so /	Very Much so /	1 sp.
STRN 2	02.	I feel like banging on the table	Not at all /	Somewhat /	Moderately so /	Very Much so /	1 sp.
STRN 3	03.	I feel angry	Not at all /	Somewhat /	Moderately so /	Very Much so /	1 sp.
STRN 4	04.	I feel like yelling at somebody	Not at all /	Somewhat /	Moderately so /	Very Much so /	1 sp.
STRN 5	05.	I feel like breaking things	Not at all /	Somewhat /	Moderately so /	Very Much so /	1 sp
STRN 6	06.	I am mad	Not at all /	Somewhat /	Moderately so /	Very Much so /	1 sp.
STRN 7	07.	I feel irritated	Not at all /	Somewhat /	Moderately so /	Very Much so /	1 sp.
STRN 8	08.	I feel like hitting someone	Not at all /	Somewhat /	Moderately so /	Very Much so /	1 sp
STRN 9	09.	I am burned up	Not at all /	Somewhat /	Moderately so /	Very Much so /	1 sp
STRN 10	10.	I feel like swearing	Not at all /	Somewhat /	Moderately so /	Very Much so /	1 sp.

CONTACT WITH HEALTH SERVICES-HS

CONTACT WITH HEALTH SERVICES

GENERAL PRACTITIONER

HS1 1. "How many times did you see a general practitioner or family doctor, or specialist during the last year?"(Prior to last emergency treatment) Excludes dentist, psychiatrist

Circle "Not" / one time / 2-3 times / 4 or more times (1 / 2 / 3 / 4) 1sp.

HS 2 2. "Could you give the approximate dates of the last time you contacted a doctor before you (poisoned/harmed) yourself? Why did you contact him/her, what were your complaints" Did the doctor prescribe any medicines?"

Date of last contact (before parasuicide) 6 sp.
day /month/ year

HS2 A Reason (circle): physical / psychological / both physical and psychological (1 / 2 / 3) 1sp.

US2B Medicines prescribed (circle) Yes / No (1 / 2) 1sp. If HS 2B = 2 skip to HS3

HS2C Name medications 40 sp.

If medicines prescribed ask:
"Did you use any of the medicines prescribed in that contact for self-poisoning (did you deliberately overdose)?" If HS 2D = 2 skip to HS3

HS 2D Circle Yes / No (1 / 2) 1sp If yes, specify medication 40 sp
HS 2D Desc

3. "At the time of your last contact with the doctor, did you have thoughts about poisoning or injuring yourself?" If HS3 = 1 skip to HS4

HS 3 Circle No / To some extent / yes, definitely (1 / 2 / 3) 1sp

If "To some extent" or "yes definitely" ask:

"Did you talk to the doctor about these thoughts? Maybe you vaguely referred to such plans, or didn't you talk about it at all?"

HS3A Circle Yes / Vaguely referred to / No (1 / 2 / 3)

In-patient psychiatric treatment (includes treatment on psychiatric ward of general hospital)

HS4 4. "How many times, if ever, have you been treated in a psychiatric hospital, in a psychiatric ward of a general hospital, or in any other in-patient institutions for people with mental problems?" Be sure that the patient refers to in-patient treatment: "you were in hospital both night and day." In-patient treatment after the index-parasuicide not included.

circle 1 never / 2 1 time / 3 2-3 times / 4 4 times or more 1 sp. If HS4=1 skip to HS6

If "never" continue with question 6

5. If one or more times inpatient treatment:
"Could you, as accurately as possible and for each admission separately, describe: when you were admitted, and how long you stayed there."
Start with last admission. If patient in in-patient treatment at time of parasuicide, start facts on this treatment. Do not code admissions after present parasuicide.

	A Admission		L Length of stay	
HS5A1	1. 4 sp month year	HS5L1	3 sp	(weeks)
HS5A2	2. 4 sp month year	HS5L2	3 sp	(weeks)
HS5A3	3. 4 sp month year	HS5L3	3 sp	(weeks)
HS5A4	4. 4 sp month year	HS5L4	3 sp	(weeks)
HS5A5	5. 4 sp month year	HS5L5	3 sp	(weeks)
HS5A6	6. 4 sp month year	HS5L6	3 sp	(weeks)

6. Out-patient psychiatric treatment and day care

HS6 A B C D E "Have you ever been in contact with one of the following professional services for treatment or advice?"

1 2
(EXAMPLE)
Yes / No Psychiatric service, day-care/day hospital 1 sp

Yes / No Community Mental Health Centre 1 sp

Yes / No Private psychologist or psychiatrist 1 sp

Yes / No Consultation service for alcohol and drug related problems 1 sp

Yes / No Consultation service for marriage relational and sexual problems 1 sp.

7. **"Were you admitted to inpatient treatment both day and night as a result of the most recent attempt?"**

HS7 1 1sp Yes; 2 1sp No

8. Other treatment of emotional problems

"Have you ever received treatment or assistance for emotional problems from anyone else? For instance self-helps groups like Alcoholics Anonymous, Distress line, telephone services, etc.?"

HS8 1 1sp Yes; 2 1sp No

9. This question only if respondent has treatment

"Did anything happen in the treatment you received that in your view may have had something to do with you (poisoning/harming) yourself last week?

HS9 1 1sp Yes; 2 1sp No

10. **"How do you feel about the treatment you received at the _____ hospital during your last episode? (Was the medical treatment helpful? How were you treated?)"**

HS10 1 Excellent / 2 Very Good / 3 Good / 4 Fair / 5 Poor 1 sp.

HS10 DESC 40 sp

11. **"Do you have any suggestions for changes in emergency procedures which would benefit people such as yourself?"**

HS11 Desc1 60 sp.

HS11 Desc2 60 sp

SOCIAL SUPPORT SCALE

"Now I would like you to fill in a short questionnaire which deals with the questions to what extent you feel you get support from and give support to your relatives and your friends. In the questionnaire, two types of support are distinguished. On the one hand practical support, which means help with practical things such as looking after the house when one is away, helping with minor repairs or other practical things one finds difficult, and providing financial support (for instance by lending or giving money). On the other hand moral or emotional support, which means being available for a talk when one feels bad, talking about feelings or giving advice in emotional matters. Start with reading the instructions and if you have any questions regarding the questionnaire, please ask me."

NOW TURN THIS PAGE AND HAND OVER BOOKLET TO THE PATIENT

SOCIAL SUPPORT – SS

This questionnaire is about the extent that you feel you need and get support from your family and friends in daily life, and about the extent that your family and friends get support from you. In the questionnaire two general kinds of support are distinguished:

- practical support refers to support concerning daily activities such as looking after your house when you are away, looking after your children, pets or flowers, looking after you or doing the shopping when you are ill, etc. Practical support also includes financial support.

- moral support refers to emotional support when minor or major problems arise. Moral support includes that people are available to share worries with, to talk about personal problems, etc.

Please read each question (on the left side of the page) carefully. Then circle in both the columns on the right side of the page (labelled FROM FAMILY and labelled FROM FRIENDS) the answer that applies best to how you feel about it (either 1, 2, or 3). Please answer all questions. Do not spend too much time on any one question. If you have any questions or need help, please ask the interviewer.

	WHETHER YOU NEED SUPPORT	***FROM FAMILY***	***FROM FRIENDS***
		A	B
SS1A SS1B	01. Do you feel that you need <u>practical support</u>?	1sp. 1. no, not at all 2. to some extent 3. yes, very much 4. not applicable	1sp. 1. no, not at all 2. to some extent 3. yes, very much 4. not applicable
SS2A SS2B	02. Do you feel that you need <u>emotional support</u>?	1sp. 1. no, not at all 2. to some extent 3. yes, very much 4. not applicable	1sp. 1. no, not at all 2. to some extent 3. yes, very much 4. not applicable

	WHETHER YOU GET SUPPORT	***FROM FAMILY***	***FROM FRIENDS***
SS3A SS3B	03. Do you feel that you get the <u>practical support</u> you need?	1sp 1. no, not at all 2. to some extent 3. yes, very much 4. not applicable	1sp 1. no, not at all 2. to some extent 3. yes,very much 4. not applicable
SS4A SS4B	04. Do you feel that you get the <u>emotional support</u> you need?	1sp 1. no, not at all 2. to some extent 3. yes, very much 4. not applicable	1sp. 1. no, not at all 2. to some extent 3. yes,very much 4. not applicable

	WHETHER YOU ARE NEEDED FOR SUPPORT	BY FAMILY A	BY FRIENDS B
SS5A SS5B	05. Do you feel that you are needed for practical support?	1. no, not at all 1sp. 2. to some extent 3. yes, very much 4. not applicable	1. no, not at all 1sp 2. to some extent 3. yes,very much 4. not applicable
SS6A SS6B	06. Do you feel that you are needed for emotional support?	1. no, not at all 1sp 2. to some extent 3. yes, very much 4. not applicable-	1. no, not at all 1sp 2. to some extent 3. yes,very much 4. not applicable
	WHETHER YOU GIVE SUPPORT	**TO FAMILY**	**TO FRIENDS**
SS7A SS7B	07 Do you feel that you give the practical support that is needed from you?	1. no, not at all 1sp 2. to some extent 3. yes, very much 4. not applicable	1. no, not at all 1sp 2. to some extent 3. yes,very much 4. not applicable
SS8A SS8B	08. Do you feel that you give the emotional support that is needed from you?	1. no, not at all 2. to some extent 3. yes, very much 4. not applicable	1. no, not at all 2. to some extent 3. yes,very much 4. not applicable

WHEN FINISHED, PLEASE HAND OVER THIS BOOKLET BACK TO THE INTERVIEWER

ROSENBERG SELF ESTEEM SCALE

"Now I would like you to fill in one more short questionnaire on how you feel about yourself at this moment. Please read the instructions carefully before you start."

TURN THIS PAGE AND HAND OVER BOOKLET TO THE PATIENT

ROSENBERG SELF ESTEEM SCALE - SE

Below are ten statements about how you feel about yourself. Please read each statement carefully and mark the option which best reflects the way you feel about yourself AT THE PRESENT TIME. Circle the words STRONGLY AGREE if you completely agree with the statement. Circle AGREE if you agree but not completely. Circle DISAGREE if you think the statement does absolutely not reflect the way you feel about yourself.
There are no right or wrong answers. Please do not skip statements. Do not spend too much time on any one statment.

NOW PLEASE READ EACH STATEMENT CAREFULLY AND CIRCLE THE ANSWERS THAT REFLECT BEST HOW YOU FEEL ABOUT YOURSELF RIGHT NOW.

		1	2	3	4	
SE 1	1. On the whole I am satisfied with myself.	Stongly agree /	Agree /	Disagree /	Strongly disagree	1 sp
SE 2	2. At times I think I am no good at all.	Strongly agree /	Agree /	Disagree /	Strongly disagree	1 sp
SE 3	3. I feel that I have a number of good qualities	Strongly agree /	Agree /	Disagree /	Strongly disagree	1 sp
SE 4	4. I feel that I do not have much to be proud of.	Strongly agree /	Agree /	Disagree /	Strongly disagree	1 sp
SE 5	5. I am able to do things as well as most people.	Strongly agree /	Agree /	Disagree /	Strongly disagree	1 sp.
SE 6	6. I certainly feel useless at times.	Strongly agree /	Agree /	Disagree /	Strongly disagree	1 sp
SE 7	7. I feel that I am a person of worth, at least as good as others.	Strongly agree /	Agree /	Disagree /	Strongly disagree	1 sp
SE 8	8. I wish I could have more respect for myself.	Strongly agree /	Agree /	Disagree /	Strongly disagree	1 sp
SE 9	9. I take a positive attitude towards myself.	Strongly agree /	Agree /	Disagree /	Strongly disagree	1 sp

SE 10	10.	All in all I am inclined to feel that I am a failure.	1 Strongly agree /	2 Agree /	3 Disagree /	4 Strongly disagree	15

WHEN FINISHED, PLEASE HAND OVER THIS BOOKLET BACK TO THE INTERVIEWER

SOCIAL ADJUSTMENT SELF REPORT QUESTIONNAIRE

We are interested in finding out how you have been doing in the past two weeks. We would like you to answer some questions about your work, spare time and your family life. There are no right or wrong answers to these questions.

Circle the number of the answer you choose.

SOCIAL ADJUSTMENT SELF REPORT QUESTIONNAIRE - SA

A:

1. Have you had enough money to take care or your own and your family's financial needs during the last two weeks?

SAA1 — 1 sp

1 = I had enough money for needs
2 = I usually had enough money with minor problems
3 = About half the time I did not have enough money but did not have to borrow money
4 = I usually did not have enough money and had to borrow from others
5 = I had great financial difficulty

2. How many friends have you seen or spoken to on the telephone in the last two weeks?

SAA2 — 1 sp

1 = Nine or more friends
2 = Five to eight friends
3 = Two to four friends
4 = One friend
5 = No friends

3. Have you been able to talk about your feelings and problems with at least one friend during the last two weeks?

SAA3 — 1 sp

1 = I can always talk about my innermost feelings
2 = I usually can talk about my feelings
3 = About half the time I felt able to talk about my feelings
4 = I usually was not able to talk about my feelings
5 = I was never able to talk about my feelings
8 = No applicable; I have no friends

4. How many times in the last two weeks have you gone out socially with other people? For example, visited friends, gone to movies, bowling, church, restaurants, invited friends to your home?

SAA4 — 1 sp

1 = More than three times
2 = Three times
3 = Twice
4 = Once
5 = None

SAA5

5. How much time have you spent on hobbies or spare time interests during the last two weeks? For example, bowling, sewing, gardening, sports, reading?

1 sp

1 = I spent most of my spare time on hobbies almost every day
2 = I spent some spare time on hobbies some of the days
3 = I spent a little spare time on hobbies
4 = I usually did not spend any time on hobbies but did watch TV
5 = I did not spend any spare time on hobbies or watching TV

SAA6

6. Have you had open arguments with your friends in the last two weeks?

1 sp

1 = I had no arguments and got along very well
2 = I usually got along well but had minor arguments
3 = I had more than one argument
4 = I had many arguments
5 = I was constantly in arguments
8 = Not applicable; I have no friends

SAA7

7. If your feelings were hurt or offended by a friend during the last two weeks, how badly did you take it?

1 sp

1 = It did not affect me or it did not happen
2 = I got over it in a few hours
3 = I got over it in a few days
4 = I got over it in a week
5 = It will take me months to recover
8 = Not applicable; I have no friends

SAA8

8. Have you felt shy or uncomfortable with people in the last two weeks?

1 sp

1 = I always felt comfortable
2 = Sometimes I felt uncomfortable but could relax after a while
3 = About half the time I felt uncomfortable
4 = I usually felt uncomfortable
5 = I always felt uncomfortable
8 = Not applicable; I was never with people

9. Have you felt lonely and wished for more friends during the last two weeks?

SAA9

1 sp

1 = I have not felt lonely
2 = I have felt lonely a few times
3 = About half the time I felt lonely
4 = I usually felt lonely
5 = I always felt lonely and wished for more friends

10. Have you felt bored in your spare time during the last two weeks?

SAA10

1sp.

1 = I never felt bored
2 = I usually did not feel bored
3 = About half the time I felt bored
4 = Most of the time I felt bored
5 = I was constantly bored

B: **TWO SECTIONS (B or C)**

Choose the correct section by reading the following instructions.

If you are living with your spouse or have been living with someone in a permanent relationship, as if you are married, please fill out SECTION B.

If you are single, separated or divorced, please fill out SECTION C.

SAB **SECTION B** If SAB = 1 skips to SAC 1

SAB1 1. Have you had open arguments with your partner in the last two weeks?

1sp

1 = We had no arguments and we got along well
2 = We usually got along well but had minor arguments
3 = We had more than one argument
4 = We had many arguments
5 = We were constantly in arguments

2. Have you been able to talk about your feelings and problems with your partner during the last two weeks?

SAB 2 1sp

1 = I could always talk freely about my feelings
2 = I usually could talk about my feelings
3 = About half the time I felt able to talk about my feelings
4 = I usually was not able to talk about my feelings
5 = I was never able to talk about my feelings

3. Have you been demanding to have your own way at home during the last two weeks?

SAB3 1sp

1 = I never insist on having my own way
2 = I hardly ever insist on having my own way
3 = About half the time I insist on having my own way
4 = I usually insist on having my own way
5 = I always insist on having my own way

4. Have you been bossed around by your partner these last two weeks?

SAB4 1 sp.

1 = Almost never
2 = Once in a while
3 = About half the time
4 = Most of the time
5 = Always

5. How much have you felt dependent on your partner these last two weeks?

SAB5 1sp.

1 = I was independent
2 = I was usually dependent
3 = I was somewhat independent
4 = I was usually dependent
5 = I depended on my partner for everything

6. How have you felt about your partner in the last two weeks?

SAB6 1sp

1 = I always felt affection
2 = I usually felt affection
3 = About half the time I felt dislike and half the time affection
4 = I usually felt dislike
5 = I always felt dislike

7. How often do you and your partner have intercourse?

SAB7 1sp.

1 = More than twice a week
2 = Once or twice a week
3 = Once every two weeks
4 = Less than every two weeks but at least once in the last month
5 = Not at all in a month or longer

8. Have you had any problems during intercourse, such as pain these last two weeks?

SABB

1 = None
2 = Once or twice
3 = About half the time
4 = Most of the time
5 = Always
8 = Not applicable; no intercourse in the last month

lsp.

9. How have you felt about intercourse during the last two weeks, even if you and your partner have not engaged in such activity during this time?

SAB9

1 = I would always have enjoyed it.
2 = I would usually have enjoyed it.
3 = About half the time I would and half the time I would not have enjoyed it.
4 = I would usually not have enjoyed it.
5 = I would never have enjoyed it.

lsp

Skips over to SA D

7

DO NOT COMPLETE SECTION C IF YOU HAVE ALREADY COMPLETED SECTION B

SECTION C

1. How many times have you been with a date these last two weeks?

1sp

SAC1

1 = More than three times
2 = Three times
3 = Twice
4 = Once
5 = Never

2. Have you been interested in dating during the last two weeks? If you have not dated, would you have liked to?

1sp

SA C2

1 = I was always interested in dating
2 = Most of the time I was interested
3 = About half the time I was interested
4 = Most of the time I was not interested
5 = I was completely uninterested

If you have EVER BEEN MARRIED, EVER LIVED WITH SOMEONE AS IF YOU WERE MARRIED, OR EVER HAD CHILDREN please answer the following questions.

IF THIS DOES NOT APPLY TO YOU CHECK HERE ___ AND GO TO SECTION E.

If SAD = 1 skips to SAE

SAD **SECTION D**

1. Have you worried about your partner or any of your children without any reason during the last two weeks, even if you are not living together now?

SAD 1 1sp

1 = I never worried
2 = Once or twice I worried
3 = About half the time I worried
4 = Most of the time I worried
5 = I always worried
8 = Not applicable; partner and children not living

2. During the last two weeks have you been thinking that you have let down your partner or any of your children at any time?

SAD2 1sp

1 = I did not feel I let them down at all
2 = I usually did not feel that I let them down
3 = About half the time I felt I let them down
4 = Most of the time I have felt that I let them down
5 = I let them down completely

3. During the last two weeks, have you been thinking that your partner or any of your children have let you down at any time?

SAD3 1sp

1 = I never felt that they let me down
2 = I felt that they usually did not let me down
3 = About half the time I felt they let me down
4 = I usually felt they let me down
5 = I felt bitter that they let me down

If you have UNMARRIED CHILDREN, STEPCHILDREN OR FOSTER CHILDREN LIVING AT HOME DURING THE LAST TWO WEEKS please answer the following questions.

IF THIS DOES NOT APPLY TO YOU CHECK HERE___ AND GO TO SECTION F.

SAE **SECTION E.** If SAE = 1, skips to SAF

1. Have you been interested in what your children are doing (friends, school, play or hobbies) during the last two weeks?

SAE1 1 sp

1 = I was always interested and actively involved
2 = I was usually interested and involved
3 = About half the time interested and half the time not interested
4 = I usually was disinterested
5 = I was always disinterested

2. Have you been able to talk and listen to your children during the last two weeks? (Include only children over the age of 2.)

SAE2 1 sp

1 = I always was able to communicate with them
2 = I usually was able to communicate with them
3 = About half the time I could communicate
4 = I usually was not able to communicate
5 = I was completely unable to communicate
8 = Not applicable; no children over the age of 2

3. How have you been getting along with the children during the last two weeks?

SAE3 1 sp

1 = I had no arguments and got along very well
2 = I usually got along well but had minor arguments
3 = I had more than one argument
4 = I had many arguments
5 = I was constantly in arguments

4. How have you felt toward your children these two weeks?

SAE4 1 sp.

1 = I always felt affection
2 = I mostly felt affection

3 = About half the time I felt affection
4 = Most of the time I did not feel affection
5 = I never felt affection toward them

EVERYONE please answer these questions about relatives even if your relatives are <u>not</u> living.

SECTION F

1. During the last two weeks, have you been thinking that you have let any of your relatives down or have been unfair to them at any time?

SAF1 | Sp

1 = I did not feel that I let them down at all
2 = I usually did not feel that I let them down
3 = About half the time I felt that I let them down
4 = Most of the time I have felt that I let them down
5 = I always felt that I let them down

2. During the last two weeks, have you been thinking that any of your relatives have let you down or have been unfair to you at any time?

SAF2 | Sp

1 = I never felt that they let me down
2 = I felt that they usually did not let me down
3 = About half the time I felt they let me down
4 = I usually have felt that they let me down
5 = I am very bitter that they let me down

Please answer the following questions about your parents, brothers, sisters, inlaws and children NOT living at home.

IF NONE OF THESE RELATIVES ARE LIVING CHECK HERE ____ AND GO ON TO SECTION H.

If SAG = 1, skips to SAH

SAG **SECTION G**

1. Have you had open arguments with your relatives in the last two weeks?

SAG 1 1 sp.

1 = We always got along very well.
2 = We usually got along well but had some minor arguments
3 = I had more than one argument with at least one relative
4 = I had many arguments
5 = I was constantly in arguments

2. Have you been able to talk about your feelings and problems with at least one of your relatives in the last two weeks?

SAG 2 1 sp

1 = I can always talk about my feelings with at least one relative
2 = I usually can talk about my feelings
3 = About half the time I felt able to talk about my feelings
4 = I usually was not able to talk about my feelings
5 = I was never able to talk about my feelings

3. Have you avoided contacts with your relatives these last two weeks?

SAG3 1 sp

1 = I have contacted relatives regularly
2 = I have contacted a relative at least once
3 = I have waited for my relatives to contact me
4 = I avoided my relatives, but they contacted me
5 = I have had no contacts with any relatives

4. Did you depend on your relatives for help, advice, money or friendship during the last two weeks?

SAG4 1 sp

1 = I never need to depend on them
2 = I usually did not need to depend on them

3 = About half the time I needed to depend on them
4 = Most of the time I depend on them
5 = I depend completely on them

---

5. Have you wanted to do the <u>opposite</u> of what your relatives wanted in order to make them angry during the last two weeks?

SAG 5

1 sp.

1 = I never wanted to oppose them
2 = Once or twice I wanted to oppose them
3 = About half the time I wanted to oppose them
4 = Most of the time I wanted to oppose them
5 = I always oppose them

---

6. Have you been worried about things happening to your relatives without good reason in the last two weeks?

SAG 6

1 sp.

1 = I have not worried without reason
2 = One or twice I worried
3 = About half the time I worried
4 = Most of the time I worried
5 = I have worried the entire time

SECTION H

Please check the situation that describes you best:

I am:

SAH

1 = A worker for pay more than 15 hours a week	___	GO TO I
2 = A housewife working less than 15 hours outside the home	___	GO TO J
3 = A student going to school half time or more	___	GO TO K
4 = Unemployed	___	
5 = Retired	___	

PERSONS WORKING OUTSIDE THE HOME MORE THAN 15 HOURS PER WEEK

SECTION I

SAI1 1. How many hours a week do you usually work? 2 sp.

SAI2 2. How many hours did you work in the last week? 2 sp

SAI3 3. The week before that? 2 sp.

SAI4 4. How many days did you miss from work during the last two weeks?

1 sp.

1 = No days missed
2 = One day
3 = I missed about half the time
4 = Missed more than half the time but did make at least one day
5 = I did not work any days

SAI5 5. Have you been able to do your work in the last two weeks?

1 sp.

1 = I did my work very well
2 = I did my work well but had some minor problems
3 = I needed help with work and did not do well about half the time
4 = I did my work poorly most of the time
5 = I did my work poorly all the time

SAI6 6. Have you been ashamed of how you did your work in the last two weeks?

1 sp.

1 = I never felt ashamed
2 = Once or twice I felt a little ashamed
3 = About half the time I felt ashamed
4 = I felt ashamed most of the time
5 = I felt ashamed all the time

SAI7 7. Have you had any arguments with people at work in the last two weeks?

1 sp.

1 = I had no arguments and got along very well
2 = I usually got along well but had minor arguments
3 = I had more than one argument
4 = I had many arguments
5 = I was constantly in arguments

---

8. Have you felt upset, worried, or uncomfortable while doing your work during the last two weeks?

SA18 1 sp

1 = I never felt upset
2 = Once or twice I felt upset
3 = Half the time I felt upset
4 = I felt upset most of the time
5 = I felt upset all of the time

---

9. Have you found your work interesting during the last two weeks?

SA19 1 sp

1 = My work was almost always interesting
2 = Once or twice my work was not interesting
3 = Half the time my work was uninteresting
4 = Most of the time my work was uninteresting
5 = My work was always uninteresting

HOUSEWIFE WORKING INSIDE THE HOME AND LESS THAN 15 HOURS OUTSIDE THE HOME

SECTION J

SAJ 1 **1. How many days did you do some housework during the last two weeks?**

1 sp.

1 = Everyday
2 = I did the housework almost every day
3 = I did the housework about half the time
4 = I usually did not do the housework
5 = I was completely unable to do the housework

SAJ 2 **2. During the last two weeks have you kept up with your housework? This includes cooking, cleaning, laundry, grocery shopping, and errands.**

1 sp.

1 = I did my work very well
2 = I did my work well but had some minor problems
3 = I needed help with my work and did not do it well about half the time
4 = I did the work poorly most of the time
5 = I did my work poorly all of the time

3. Have you been ashamed of how you did your housework during the last two weeks?

SAJ 3

1 sp.

1 = I never felt ashamed
2 = Once or twice I felt a little ashamed
3 = About half the time I felt ashamed
4 = I felt ashamed most of the time
5 = I felt ashamed all the time

4. Have you had any arguments with salespeople, tradesmen or neighbors in the last two weeks?

SAJ 4

1 sp.

1 = I had no arguments and got along very well
2 = I usually got along well, but had minor arguments
3 = I had more than one argument
4 = I had many arguments

5 = I was constantly in arguments

---

5. Have you felt upset while doing your housework during the last two weeks?

SAJ5 1 = I never felt upset 1sp.
2 = Once or twice I felt upset
3 = Half the time I felt upset
4 = I felt upset most of the time
5 = I felt upset all of the time

---

6. Have you found your housework interesting during the last two weeks?

SAJ6 1sp.
1 = My work was almost always interesting
2 = Once or twice my work was not interesting
3 = Half the time my work was uninteresting
4 = Most of the time my work was uninteresting
5 = My work was always uninteresting

SECTION K

SAK1

1. (1) Full time _____
   (2) 3/4 time _____
   (3) Half time _____

1 sp.

---

2. How many days of classes did you miss in the last two weeks?

SAK2

1 sp.

1 = No days missed
2 = a few days missed
3 = I missed about half the time
4 = Missed more than half time but did make at least one day
5 = I did not go to classes at all

---

3. Have you been able to keep up with your class work in the last two weeks?

SAK 3

1 sp.

1 = I did my work very well
2 = I did my work well but had minor problems
3 = I needed help with my work and did not do well about half the time
4 = I did my work poorly most of the time
5 = I did my work poorly all the time

---

4. During the last two weeks, have you been ashamed of how you do your school work?

SAK4

1 sp

1 = I never felt ashamed
2 = Once or twice I felt ashamed
3 = About half the time I felt ashamed
4 = I felt ashamed most of the time
5 = I felt ashamed all of the time

---

5. Have you had any arguments with people at school in the last two weeks?

SAK5

1 sp.

1 = I had no arguments and got along very well
2 = I usually got along well but had minor arguments
3 = I had more than one argument

4 = I had many arguments
5 = I was constantly in arguments
8 = Not applicable; I did not attend school

1sp

---

6. Have you felt upset at school during the last two weeks?

SAK6

1 = I never felt upset
2 = Once or twice I felt upset
3 = Half the time I felt upset
4 = I felt upset most of the time
5 = I felt upset all of the time
6 = Not applicable; I did not attend school

1 sp.

---

7. Have you found your school work interesting during the last two weeks?

SAK7

1 = My work was almost always interesting
2 = Once or twice my work was not interesting
3 = Half the time my work was uninteresting
4 = Most of the time my work was uninteresting
5 = My work was always uninteresting

1 sp.

BRIEF MAST - BM

The Brief MAST

		QUESTIONS	CIRCLE CORRECT ANSWERS 1	2	
BM1	1	Do you feel you are a normal drinker	Yes	No	1sp
BM2	2	Do friends or relatives think you are a normal drinker?	Yes	No	1sp
BM3	3	Have you ever attended a meeting of Alcoholics Anonymous (AA)?	Yes	No	1sp
BM4	4	Have you ever lost friends or girlfriends/boyfriends because of drinking?	Yes	No	1sp
BM5	5	Have you ever gotten into trouble at work because of drinking?	Yes	No	1sp
BM6	6	Have you ever neglected your obligations, your family, or your work for two or more days in a row because you were drinking?	Yes	No	1sp
BM7	7	Have you ever had delirium tremens (DTs), severe shaking, heard voices or seen things that weren't there after heavy drinking?	Yes	No	1sp
BM8	8	Have you ever gone to anyone for help about your drinking?	Yes	No	1sp
BM9	9	Have you ever been in a hospital because of drinking?	Yes	No	1sp
BM10	10	Have you ever been arrested for drunk driving or driving after drinking?	Yes	No	1sp

BM 11 Des 1 60 sp.

BM 11 Des 2 60 sp.

Appendix B – Follow-up Interview Question Regarding Repeat Parasuicide

PREVIOUS PARASUICIDES - PP

PREVIOUS PARASUICIDES

1. Since the original interview (the first time we talked to you), have you poisoned or injured yourself? For instance by taking an overdose of medicines or drugs, by cutting your wrists, by trying to hang or drown yourself, by provoking accidents involving yourself, etc.

If PP1A = 2, skips to SB1

PP1A Yes 1 ___ No 2 ___ Isp.

Appendix C – Relationships Between Variables

Table C.1 – Significance of Relationship between Other Variables and *previous* (using Pearson Chi-Square)

Variable	P-value
age	0.001
anxietyc	<0.001
badhome	0.002
badrelat	0.020
bhtot	<0.001
drugsc	0.043
gender	0.133
genmhlth	<0.001
impuls	<0.001
income	<0.001
intent	0.009
interven	0.522
lantisoc	0.004
livalone	0.012
lonely	<0.001
mast	<0.001
motext	0.305
motint	0.057
motunb	0.001
noparent	0.136
pabusec	<0.001
paramod	0.084
parsplit	0.206
phl	0.883
sabusec	<0.001
sepwidiv	0.011
socadj	<0.001
stan	<0.001
stat	0.073
suicmod	0.017
supgetfa	0.008
supgivfa	0.034
suppfren	0.512
suppneed	0.090
unemploy	0.725

Table C.2 – Significance of Relationship between Other Variables and *lschiz* (using Pearson Chi-Square)

Variable	P-value
age	0.287
anxietyc	<0.001
badhome	0.018
badrelat	0.782
bhtot	<0.001
drugsc	0.002
gender	0.104
genmhlth	<0.001
impuls	0.124
income	0.078
intent	0.049
interven	0.036
lantisoc	0.167
livalone	<0.001
lonely	<0.001
mast	0.419
motext	0.017
motint	0.007
motunb	0.001
noparent	0.300
pabusec	0.093
paramod	0.175
parsplit	0.934
phl	0.291
sabusec	0.016
sepwidiv	0.961
socadj	<0.001
stan	<0.001
stat	0.021
suicmod	0.148
supgetfa	0.003
supgivfa	0.161
suppfren	0.988
suppneed	0.626
unemploy	0.419

Table C.3 – Significance of Relationship between Other Variables and *ldepress* (using Pearson Chi-Square)

Variable	P-value
age	0.012
anxietyc	<0.001
badhome	<0.001
badrelat	<0.001
bhtot	<0.001
drugsc	0.006
gender	0.082
genmhlth	<0.001
impuls	<0.001
income	0.293
intent	<0.001
interven	0.003
lantisoc	0.379
livalone	0.011
lonely	<0.001
mast	0.624
motext	0.010
motint	0.001
motunb	<0.001
noparent	0.402
pabusec	<0.001
paramod	0.534
parsplit	<0.001
ph1	0.386
sabusec	<0.001
sepwidiv	0.002
socadj	<0.001
stan	<0.001
stat	0.002
suicmod	0.004
supgetfa	0.001
supgivfa	0.814
suppfren	0.360
suppneed	<0.001
unemploy	0.383

Table C.4 – Significance of Relationship between Other Variables and *physhlth* (using Pearson Chi-Square)

Variable	P-value
age	<0.001
anxietyc	<0.001
badhome	0.321
badrelat	0.006
bhtot	<0.001
drugsc	0.082
gender	0.466
genmhlth	<0.001
impuls	0.199
income	0.023
intent	0.499
interven	0.018
lantisoc	0.142
livalone	0.092
lonely	0.029
mast	0.006
motext	0.263
motint	0.311
motunb	0.002
noparent	0.730
pabusec	0.006
paramod	0.422
parsplit	0.309
phl	0.566
sabusec	0.002
sepwidiv	0.001
socadj	<0.001
stan	0.002
stat	0.056
suicmod	0.502
supgetfa	0.342
supgivfa	0.742
suppfren	0.401
suppneed	0.117
unemploy	0.719